

# **OIL ANALYSIS REPORT**



Machine Id 3660C

Component

**Natural Gas Engine** 

PETRO CANADA DURON GEO LD 15W40 (35 GAL)

# 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

## **Fluid Condition**

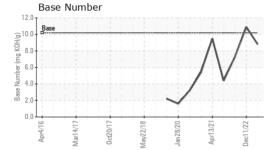
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

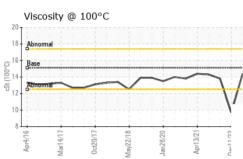
Sample Date   Client Info   38270   0   3620   1   4   3620   0   3620	35 GAL)		pr2016 M	ar2017 Oct2017 M	ay2018 Jan2020 Apr2021	Dec2022	
Sample Date   Client Info   05 May 2023   11 Dec 2022   03 Mar 2022   Machine Age   hrs   Client Info   38270   0   0   38270   0   0   0   0   0   0   0   0   0	SAMPLE INFOR	MATION	method	limit/base	current	history 1	history 2
Machine Age         hrs         Client Info         38270         0         38270           Oil Age         hrs         Client Info         38270         0         38270           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         NORMAL         SEVERE         NORMAL           WEAR METALS         method         limit/base         current         history 1         history 2           Iron         ppm         ASTM D5185m         >50         14         114         36         5           Chromium         ppm         ASTM D5185m         >4         1         6         5           Nickel         ppm         ASTM D5185m         >2         1         2         1           Silver         ppm         ASTM D5185m         >3         0         0         <1	Sample Number		Client Info		GFL0058808	GFL0048106	GFL0039410
Oil Age         hrs         Client Info         38270         0         38270           Oil Changed         Client Info         N/A         N/A         N/A         N/A           Sample Status         Domain         Normal         SEVERE         NORMAL           WEAR METALS         method         limit/base         current         history 1         history 2           Iron         ppm         ASTM D5185m         >50         14         114         36           Chromium         ppm         ASTM D5185m         >4         1         6         5           Nikel         ppm         ASTM D5185m         >4         1         6         5           Silver         ppm         ASTM D5185m         >3         0         0         <1         <1           Alluminum         ppm         ASTM D5185m         >9         0         6         4            Lead         ppm         ASTM D5185m         >30         1         5         6         6           Copper         ppm         ASTM D5185m         >30         1         1         2         4           Antimony         ppm         ASTM D5185m         >3         1	Sample Date		Client Info		05 May 2023	11 Dec 2022	03 Mar 2022
Cilent Info	Machine Age	hrs	Client Info		38270	0	38270
Sample Status         NORMAL         SEVERE         NORMAL           WEAR METALS         method         limit/base         current         history 1         history 2           Iron         ppm         ASTM D5185m         >50         14         114         36           Chromium         ppm         ASTM D5185m         >4         1         6         5           Nickel         ppm         ASTM D5185m         >2         1         2         1           Silver         ppm         ASTM D5185m         >0         0         <1	Oil Age	hrs	Client Info		38270	0	38270
WEAR METALS         method         limit/base         current         history 1         history 2           Iron         ppm         ASTM D5185m         >50         14         114         36           Chromium         ppm         ASTM D5185m         >4         1         6         5           Nickel         ppm         ASTM D5185m         >2         1         2         1           Titanium         ppm         ASTM D5185m         >3         0         0         <1	Oil Changed		Client Info		N/A	N/A	N/A
Irron	Sample Status				NORMAL	SEVERE	NORMAL
Chromium	WEAR METAL	S	method	limit/base	current	history 1	history 2
Nickel	Iron	ppm	ASTM D5185m	>50	14	<b>114</b>	
Titanium	Chromium	ppm	ASTM D5185m	>4	1	• 6	5
Silver	Nickel	ppm		>2	1	2	1
Aluminum	Titanium	ppm	ASTM D5185m		0		
Lead	Silver	ppm	ASTM D5185m	>3	0	0	<1
Copper         ppm         ASTM D5185m         >35         <1         4         3           Tin         ppm         ASTM D5185m         >4         1         1         2           Antimony         ppm         ASTM D5185m           0           Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history 1         history 2           Boron         ppm         ASTM D5185m         50         36         15         14           Barium         ppm         ASTM D5185m         50         36         15         14           Barium         ppm         ASTM D5185m         50         52         78         72           Manganese         ppm         ASTM D5185m         50         52         78         72           Manganesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         1510         1444         2011         1918	Aluminum	ppm	ASTM D5185m	>9	0	6	4
Tin	Lead	ppm	ASTM D5185m	>30	1	5	6
Antimony         ppm         ASTM D5185m          0           Vanadium         ppm         ASTM D5185m         <1	Copper	ppm	ASTM D5185m	>35	<1	4	3
Vanadium         ppm         ASTM D5185m         <1         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history 1         history 2           Boron         ppm         ASTM D5185m         50         36         15         14           Barium         ppm         ASTM D5185m         50         0         0         0           Molybdenum         ppm         ASTM D5185m         50         52         78         72           Manganese         ppm         ASTM D5185m         50         52         78         72           Magnesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         1510         1444         2011         1918           Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         >+100         7	Tin	ppm	ASTM D5185m	>4	1	1	2
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history 1         history 2           Boron         ppm         ASTM D5185m         50         36         15         14           Barium         ppm         ASTM D5185m         5         0         0         0           Molybdenum         ppm         ASTM D5185m         50         52         78         72           Manganese         ppm         ASTM D5185m         50         52         78         72           Magnesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         1510         1444         2011         1918           Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         >+100         7	Antimony	ppm	ASTM D5185m				0
ADDITIVES         method         limit/base         current         history 1         history 2           Boron         ppm         ASTM D5185m         50         36         15         14           Barium         ppm         ASTM D5185m         50         0         0         0           Molybdenum         ppm         ASTM D5185m         50         52         78         72           Manganese         ppm         ASTM D5185m         50         52         78         72           Magnesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         >20         3         5         <1	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         5         0         0         0           Molybdenum         ppm         ASTM D5185m         50         52         78         72           Manganese         ppm         ASTM D5185m         0         <1         4         2           Magnesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         1510         1444         2011         1918           Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         >20         3         5         <1	ADDITIVES		method	limit/base	current	history 1	history 2
Molybdenum         ppm         ASTM D5185m         50         52         78         72           Manganese         ppm         ASTM D5185m         0         <1         4         2           Magnesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         1510         1444         2011         1918           Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         >20         3         5         <1           INFRA-RED         method         l	Boron	ppm	ASTM D5185m	50	36	15	14
Manganese         ppm         ASTM D5185m         0         <1         4         2           Magnesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         1510         1444         2011         1918           Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1	Barium	ppm	ASTM D5185m	5	0	0	0
Magnesium         ppm         ASTM D5185m         560         625         735         769           Calcium         ppm         ASTM D5185m         1510         1444         2011         1918           Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         >5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1           INFRA-RED         method         limit/base         current         history 1         history 2           Soot %         *ASTM D7624         >20         6.5         16.9         14.1           Sulfation         Abs/:nm         *ASTM D7415         >30 <th< td=""><td>Molybdenum</td><td>ppm</td><td>ASTM D5185m</td><td>50</td><th>52</th><td>78</td><td>72</td></th<>	Molybdenum	ppm	ASTM D5185m	50	52	78	72
Calcium         ppm         ASTM D5185m         1510         1444         2011         1918           Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1	Manganese	ppm	ASTM D5185m	0	<1	4	2
Phosphorus         ppm         ASTM D5185m         780         818         1063         1035           Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1	Magnesium	ppm	ASTM D5185m	560	625	735	769
Zinc         ppm         ASTM D5185m         870         992         1277         1149           Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1           INFRA-RED         method         limit/base         current         history 1         history 2           Soot %         %         *ASTM D7844         0         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.5         16.9         14.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.9         26.7         25.4           FLUID DEGRADATION method         limit/base         current         history 1         history 2	Calcium	ppm	ASTM D5185m	1510	1444	2011	1918
Sulfur         ppm         ASTM D5185m         2040         3137         3547         2593           CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1           INFRA-RED         method         limit/base         current         history 1         history 2           Soot %         %         *ASTM D7844         0         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.5         16.9         14.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.9         26.7         25.4           FLUID DEGRADATION method         limit/base         current         history 1         history 2	Phosphorus	ppm	ASTM D5185m	780	818	1063	1035
CONTAMINANTS         method         limit/base         current         history 1         history 2           Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1	Zinc	ppm	ASTM D5185m	870	992	1277	1149
Silicon         ppm         ASTM D5185m         >+100         7         22         16           Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1           INFRA-RED         method         limit/base         current         history 1         history 2           Soot %         %         *ASTM D7844         0         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.5         16.9         14.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.9         26.7         25.4           FLUID DEGRADATION method         limit/base         current         history 1         history 2	Sulfur	ppm	ASTM D5185m	2040	3137	3547	2593
Sodium         ppm         ASTM D5185m         5         13         10           Potassium         ppm         ASTM D5185m         >20         3         5         <1	CONTAMINAN	ITS	method	limit/base	current	history 1	history 2
Potassium         ppm         ASTM D5185m         >20         3         5         <1           INFRA-RED         method         limit/base         current         history 1         history 2           Soot %         %         *ASTM D7844         0         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.5         16.9         14.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.9         26.7         25.4           FLUID DEGRADATION         method         limit/base         current         history 1         history 2	Silicon	ppm	ASTM D5185m	>+100	7	22	16
INFRA-RED	Sodium	ppm	ASTM D5185m		5	13	10
Soot %         %         *ASTM D7844         0         0.1         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.5         16.9         14.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.9         26.7         25.4           FLUID DEGRADATION         method         limit/base         current         history 1         history 2	Potassium	ppm	ASTM D5185m	>20	3	5	<1
Nitration         Abs/cm         *ASTM D7624         >20         6.5         16.9         14.1           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.9         26.7         25.4           FLUID DEGRADATION         method         limit/base         current         history 1         history 2	INFRA-RED		method	limit/base	current	history 1	history 2
Sulfation Abs/.1mm *ASTM D7415 >30 18.9 26.7 25.4  FLUID DEGRADATION method limit/base current history 1 history 2	Soot %	%	*ASTM D7844		0	0.1	0.1
Sulfation Abs/.1mm *ASTM D7415 >30 18.9 26.7 25.4  FLUID DEGRADATION method limit/base current history 1 history 2	Nitration	Abs/cm	*ASTM D7624	>20	6.5	16.9	14.1
	Sulfation	Abs/.1mm					
Ovidation	FLUID DEGRA	OITAC	method	limit/base	current	history 1	history 2
Oxidation Notified Act 10.0	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.3	21.2	18.8

Base Number (BN) mg KOH/g ASTM D2896 10.2 8.8



# **OIL ANALYSIS REPORT**

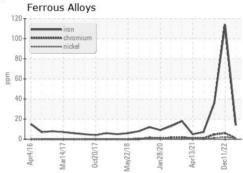


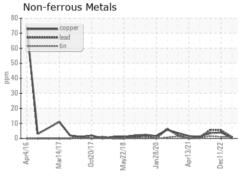


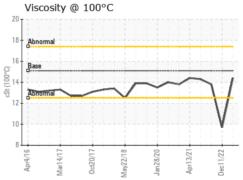
VISUAL		method	limit/base	current	history 1	history 2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	LIGHT	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

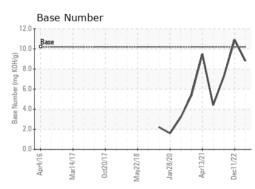
FLUID PROP	EHILO	method			flistory i	flistory 2
Visc @ 100°C	cSt	ASTM D445	15.1	14.4	<b>9</b> .7	13.8

## **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number **Unique Number** Test Package : FLEET

: GFL0058808 : 05842965 : 10467072

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 10 May 2023 Diagnosed : 11 May 2023

Diagnostician : Wes Davis

GFL Environmental - 019 - Greenville/TriEast

415 Staton Road Greenville, NC US 27834

Contact: Spencer Liggon spencer.liggon@gflenv.com T: (800)207-6618

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)