

# **OIL ANALYSIS REPORT**







Machine Id 9167 Component
Natural Gas Engine

PETRO CANADA DURON GEO LD 15W40 (--- 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

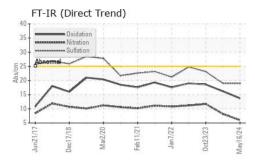
## **Fluid Condition**

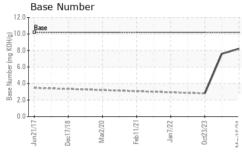
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

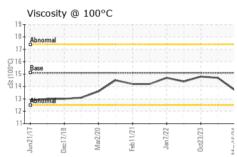
Sample Date         Client Info         16 May 2024         14 Feb 2024         23 Oct 2023           Machine Age         hrs         Client Info         16298         16081         15539           Oil Age         hrs         Client Info         0         542         654           Oil Changed Sample Status         Client Info         Not Changed NoRMAL         Changed Changed NORMAL         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         15         19         ASTM D51807/5           Very         ASTM D5185m         >50         15         19         ASTM D51807/5         1           Iron         ppm         ASTM D5185m         >5         2         1         4         1	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         16298         16081         15539           Oil Age         hrs         Client Info         0         542         654           Oil Changed         Client Info         Not Changed         Changed         Changed           Sample Status         Image: Client Info         NoRMAL         NORMAL         ABNORMAL           CONTAMINATION         method         Imitibase         current         history         history           WEAR METALS         method         limit/base         current         history         history           Iron         ppm         ASTM D5185m         >50         15         19         \$3           Nickel         ppm         ASTM D5185m         >50         15         19         \$3           Silver         ppm         ASTM D5185m         >5         2         1         4           Silver         ppm         ASTM D5185m         >3         <1         0         0           Silver         ppm         ASTM D5185m         >4         <1         1         1         6           Silver         ppm         ASTM D5185m         >40         <1         <1         1	Sample Number		Client Info		GFL0106020	GFL0106133	GFL0078677
Oil Age         hrs         Client Info         0         542         654           Oil Changed         Client Info         Not Changed         Changed         Changed           Sample Status         Client Info         NoRMAL         NoRMAL         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         15         19         ▲ 53           Chromium         ppm         ASTM D5185m         >50         15         19         ▲ 53           Nickel         ppm         ASTM D5185m         >5         2         1         4           Nickel         ppm         ASTM D5185m         >5         <1         <1         1           Lead         ppm         ASTM D5185m         >3         <1         0         0           Copper         ppm         ASTM D5185m         >40         <1         <1         1           C	Sample Date		Client Info		16 May 2024	14 Feb 2024	23 Oct 2023
Oil Changed Sample Status         Client Info         Not Changed NORMAL         Changed NORMAL         Changed NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM 05185m         >50         15         19         AS           Chromium         ppm         ASTM 05185m         >5         2         1         4           Nickel         ppm         ASTM 05185m         >5         <1	Machine Age	hrs	Client Info		16298	16081	15539
Oil Changed Sample Status         Client Info         Not Changed NORMAL         Changed NORMAL         Changed ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         15         19         AST           Nickel         ppm         ASTM D5185m         >50         15         19         AST           Nickel         ppm         ASTM D5185m         >5         2         1         4           Nickel         ppm         ASTM D5185m         >5         <1         <1         1           Nickel         ppm         ASTM D5185m         >5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1		hrs	Client Info		0	542	654
NORMAL   NORMAL   ABNORMAL			Client Info		Not Changd	Changed	Changed
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         15         19         ▲ 53           Chromium         ppm         ASTM D5185m         >5         2         1         4           Nickel         ppm         ASTM D5185m         >5         21         <1         1           Silver         ppm         ASTM D5185m         >5         <1         <1         <1           Aluminum         ppm         ASTM D5185m         >25         5         6         22           Lead         ppm         ASTM D5185m         >40         <1         <1         1         1         6           Copper         ppm         ASTM D5185m         >40         <1         <1         1         6         22         1         <1         1         0         <1         1         1         6         2         2         <1         <1         1						-	ABNORMAL
Water         WC Method         >0.1         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >50         15         19         5         5           Chromium         ppm         ASTM D5185m         >5         2         1         4           Nickel         ppm         ASTM D5185m         >5         -1         <1	· · · · · · · · · · · · · · · · · · ·	ON	method	limit/base	current	historv1	historv2
Iron							
Iron	WEAR METALS	S	method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >5         2         1         4           Nickel         ppm         ASTM D5185m         >4         <1			ASTM D5185m	>50	15		<u> 53</u>
Nickel	-				_		
Titanium							
Silver							
Aluminum							
Lead							
Copper         ppm         ASTM D5185m         >150         1         1         6           Tin         ppm         ASTM D5185m         >4         <1							
Tin ppm ASTM D5185m >-4 <1 0 <1 0 <1 Antimony ppm ASTM D5185m							
Antimony         ppm         ASTM D5185m							
Vanadium         ppm         ASTM D5185m         <1         <1         0           Beryllium         ppm         ASTM D5185m               Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         68         20         3           Barium         ppm         ASTM D5185m         50         0         0         0           Molybdenum         ppm         ASTM D5185m         50         79         46         54           Manganese         ppm         ASTM D5185m         560         556         635         528           Calcium         ppm         ASTM D5185m         780         628         793         645           Zinc         ppm         ASTM D5185m         70         824         977         957           Sulfur         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m           -				<i>&gt;</i> 4			
Beryllium	•						
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         68         20         3           Barium         ppm         ASTM D5185m         50         79         46         54           Manganese         ppm         ASTM D5185m         0         <1							
ADDITIVES	-						
Boron		ррш		limit/bass			
Barium         ppm         ASTM D5185m         5         0         0         0           Molybdenum         ppm         ASTM D5185m         50         79         46         54           Manganese         ppm         ASTM D5185m         50         79         46         54           Manganese         ppm         ASTM D5185m         560         556         635         528           Calcium         ppm         ASTM D5185m         1510         1271         1536         1567           Phosphorus         ppm         ASTM D5185m         780         628         793         645           Zinc         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m              CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         >20 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>							
Molybdenum         ppm         ASTM D5185m         50         79         46         54           Manganese         ppm         ASTM D5185m         0         <1         0         1           Magnesium         ppm         ASTM D5185m         560         556         635         528           Calcium         ppm         ASTM D5185m         1510         1271         1536         1567           Phosphorus         ppm         ASTM D5185m         780         628         793         645           Zinc         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m               CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         >20         2         0         <1           INFRA-RED         method         limit/base		ppm					
Manganese         ppm         ASTM D5185m         0         <1         0         1           Magnesium         ppm         ASTM D5185m         560         556         635         528           Calcium         ppm         ASTM D5185m         1510         1271         1536         1567           Phosphorus         ppm         ASTM D5185m         780         628         793         645           Zinc         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         >20         2         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         0.4         0 </td <td></td> <td>ppm</td> <td></td> <td>-</td> <th></th> <td></td> <td></td>		ppm		-			
Magnesium         ppm         ASTM D5185m         560         556         635         528           Calcium         ppm         ASTM D5185m         1510         1271         1536         1567           Phosphorus         ppm         ASTM D5185m         780         628         793         645           Zinc         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m               CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         >20         2         0         <1	Molybdenum	• •			-		
Calcium         ppm         ASTM D5185m         1510         1271         1536         1567           Phosphorus         ppm         ASTM D5185m         780         628         793         645           Zinc         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m               CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         >20         2         0         <1	•	ppm	ASTM D5185m	0	<1		
Phosphorus         ppm         ASTM D5185m         780         628         793         645           Zinc         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m               CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         >20         2         0         <1	Magnesium	ppm	ASTM D5185m		556	635	528
Zinc         ppm         ASTM D5185m         870         824         977         957           Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m         2040         2544         2421         2149           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         20         2         0         <1           Potassium         ppm         ASTM D5185m         >20         2         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.4         0         0           Nitration         Abs/cm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25	Calcium	ppm	ASTM D5185m	1510	1271	1536	1567
Sulfur         ppm         ASTM D5185m         2040         2544         2421         2149           Lithium         ppm         ASTM D5185m         20         2544         2421         2149           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         25         18         5         7           Sodium         ppm         ASTM D5185m         20         2         0         <1           Potassium         ppm         ASTM D5185m         20         2         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.4         0         0           Nitration         Abs/cm         *ASTM D7624         >20         6.0         8.2         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414	Phosphorus	ppm	ASTM D5185m	780	628		645
Lithium         ppm         ASTM D5185m	Zinc	ppm	ASTM D5185m	870	824	977	957
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         4         3         19           Potassium         ppm         ASTM D5185m         >20         2         0         <1		ppm	ASTM D5185m	2040	2544	2421	2149
Silicon         ppm         ASTM D5185m         >25         18         5         7           Sodium         ppm         ASTM D5185m         4         3         19           Potassium         ppm         ASTM D5185m         >20         2         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.4         0         0           Nitration         Abs/cm         *ASTM D7624         >20         6.0         8.2         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         16.2         18.6			ASTM D5185m				
Sodium         ppm         ASTM D5185m         4         3         19           Potassium         ppm         ASTM D5185m         >20         2         0         <1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.4         0         0           Nitration         Abs/cm         *ASTM D7624         >20         6.0         8.2         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         16.2         18.6	CONTAMINAN	TS	method	limit/base	current		history2
Potassium         ppm         ASTM D5185m         >20         2         0         <1	Silicon	ppm	ASTM D5185m	>25	18	5	7
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         0.4         0         0           Nitration         Abs/cm         *ASTM D7624         >20         6.0         8.2         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         16.2         18.6	Sodium	ppm	ASTM D5185m		4	3	19
Soot %         %         *ASTM D7844         0.4         0         0           Nitration         Abs/cm         *ASTM D7624         >20         6.0         8.2         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         16.2         18.6	Potassium	ppm	ASTM D5185m	>20	2	0	<1
Nitration         Abs/cm         *ASTM D7624         >20         6.0         8.2         11.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         16.2         18.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.0         19.0         23.1           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.7         16.2         18.6	Soot %	%	*ASTM D7844		0.4	0	0
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     13.7     16.2     18.6	Nitration	Abs/cm	*ASTM D7624	>20	6.0	8.2	11.7
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.7</b> 16.2 18.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.0	19.0	23.1
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 10.2 8.2 7.6 2.8	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.7	16.2	18.6
Baco rambor (Bit) ingitoring from Becoo Tole	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	8.2	7.6	2.8

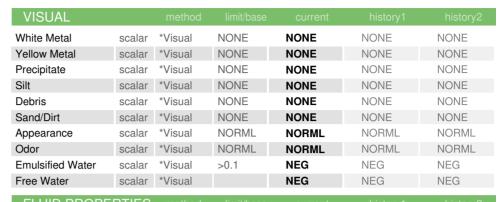


# **OIL ANALYSIS REPORT**



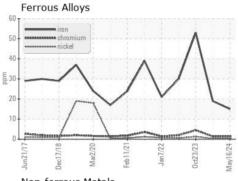


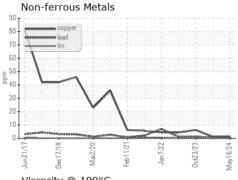


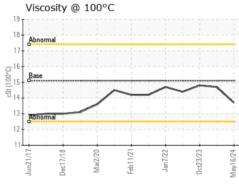


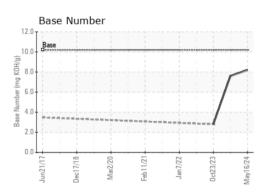
FLUID PROP	ERIIES	method			History i	nistoryz
Visc @ 100°C	cSt	ASTM D445	15.1	13.7	14.7	14.8

### **GRAPHS**













Sample No.

: GFL0106020 Lab Number : 06188705 Unique Number : 11045457

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 23 May 2024

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

GFL Environmental - 152 - Jacksonville

7580 PHILIPS HWY Jacksonville, FL US 32256

Contact: Chris Smith chris.smith@gflenv.com

T: (904)252-0013

Test Package : FLEET Certificate 12367 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)