

# **OIL ANALYSIS REPORT**



(YA152788) GFL035 12070

Component **Diesel Engine** 

PETRO CANADA DURON SHP 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

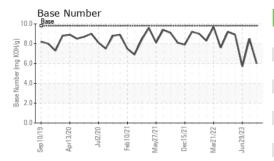
## **Fluid Condition**

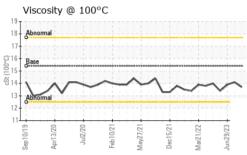
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date	N 3111 13W 40 (-		p2019 Apr21				
Sample Date	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   4461   4461   4461   4461   001 Age   hrs   Client Info   600   60	Sample Number		Client Info		GFL0085230	GFL0085151	GFL0071560
Oil Age         hrs         Client Info         600         600         600         600         600         Changed	Sample Date		Client Info		11 Jan 2024		29 Jun 2023
Client Info	Machine Age	hrs	Client Info		4461	4461	4461
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2   water   WC Method   >3.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0	Oil Age	hrs	Client Info		600	600	600
Fuel	Oil Changed		Client Info		-	Changed	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG         NEG           Glycol         WC Method         Imitibase         Current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >90         26         23         43           Chromium         ppm         ASTM D5185m         >20         1         1         1           Nickel         ppm         ASTM D5185m         >2         <1         <1         3           Silver         ppm         ASTM D5185m         >2         0         <1         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         3         3         3           Lead         ppm         ASTM D5185m         >40         <1         <1         <1         <1           Copper         ppm         ASTM D5185m         >15         <1         <1         <1         <1         <1         <1         <1         <1         <1 <t< td=""><td>CONTAMINA</td><td>TION</td><td>method</td><td>limit/base</td><th>current</th><td>history1</td><td>history2</td></t<>	CONTAMINA	TION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAI	LS	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>90	26	23	43
Titanium	Chromium	ppm	ASTM D5185m	>20	1	1	1
Silver	Nickel	ppm	ASTM D5185m	>2	<1	<1	3
Aluminum         ppm         ASTM D5185m         >20         3         3         3           Lead         ppm         ASTM D5185m         >40         <1	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >330         <1         <1         4           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	3	3	3
Tin	Lead	ppm	ASTM D5185m	>40	<1	0	<1
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         4         3           Barium         ppm         ASTM D5185m         0         0         0         2           Molybdenum         ppm         ASTM D5185m         0         66         64         65           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         901         962         813           Calcium         ppm         ASTM D5185m         1070         1103         1163         1178           Phosphorus         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1<	Copper	ppm	ASTM D5185m	>330	<1	<1	4
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         6         4         3           Barium         ppm         ASTM D5185m         0         0         0         2           Molybdenum         ppm         ASTM D5185m         0         66         64         65           Manganese         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         2           Molybdenum         ppm         ASTM D5185m         60         66         64         65           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         901         962         813           Calcium         ppm         ASTM D5185m         1070         1103         1163         1178           Phosphorus         ppm         ASTM D5185m         1150         1050         1135         962           Zinc         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/bas	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         66         64         65           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         901         962         813           Calcium         ppm         ASTM D5185m         1070         1103         1163         1178           Phosphorus         ppm         ASTM D5185m         1150         1050         1135         962           Zinc         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >6	Boron	ppm	ASTM D5185m	0	6	4	3
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         901         962         813           Calcium         ppm         ASTM D5185m         1070         1103         1163         1178           Phosphorus         ppm         ASTM D5185m         1150         1050         1135         962           Zinc         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         >20         2         2         5           Reduction         ppm         ASTM D5185m         >20         2         2         5           Sodium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base	Barium	ppm	ASTM D5185m	0	0	0	2
Magnesium         ppm         ASTM D5185m         1010         901         962         813           Calcium         ppm         ASTM D5185m         1070         1103         1163         1178           Phosphorus         ppm         ASTM D5185m         1150         1050         1135         962           Zinc         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         3         5         8           Potassium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30 <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>60</td> <th>66</th> <td>64</td> <td>65</td>	Molybdenum	ppm	ASTM D5185m	60	66	64	65
Calcium         ppm         ASTM D5185m         1070         1103         1163         1178           Phosphorus         ppm         ASTM D5185m         1150         1050         1135         962           Zinc         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Soliicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLU	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1050         1135         962           Zinc         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation	Magnesium	ppm	ASTM D5185m	1010	901	962	813
Zinc         ppm         ASTM D5185m         1270         1266         1307         1185           Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         3         5         8           Potassium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM	Calcium	ppm	ASTM D5185m	1070	1103	1163	1178
Sulfur         ppm         ASTM D5185m         2060         2866         2983         2949           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         3         5         8           Potassium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	Phosphorus	ppm	ASTM D5185m	1150	1050	1135	962
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         3         5         8           Potassium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	Zinc	ppm	ASTM D5185m	1270	1266	1307	1185
Silicon         ppm         ASTM D5185m         >25         8         10         15           Sodium         ppm         ASTM D5185m         3         5         8           Potassium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	Sulfur	ppm	ASTM D5185m	2060	2866	2983	2949
Sodium         ppm         ASTM D5185m         3         5         8           Potassium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	CONTAMINA	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2         2         5           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	Silicon	ppm		>25	8	10	15
INFRA-RED	Sodium	ppm	ASTM D5185m		3	5	8
Soot %         %         *ASTM D7844 >6         0.8         0.7         0.8           Nitration         Abs/cm         *ASTM D7624 >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415 >30         21.9         19.5         24.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         18.3         15.5         22.1	Potassium	ppm	ASTM D5185m	>20	2	2	5
Nitration         Abs/cm         *ASTM D7624         >20         11.3         9.3         12.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	Soot %	%	*ASTM D7844	>6	8.0	0.7	0.8
Sulfation         Abs/.1mm         *ASTM D7415         >30         21.9         19.5         24.3           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         18.3         15.5         22.1	Nitration	Abs/cm	*ASTM D7624	>20	11.3	9.3	12.7
Oxidation Abs/.1mm *ASTM D7414 >25 <b>18.3</b> 15.5 22.1	Sulfation	Abs/.1mm	*ASTM D7415	>30		19.5	24.3
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.3	15.5	22.1
					6.0	8.5	5.7



# **OIL ANALYSIS REPORT**

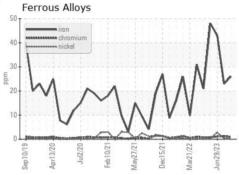


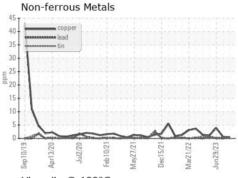


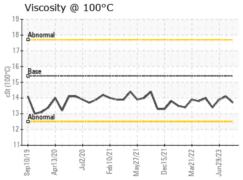
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

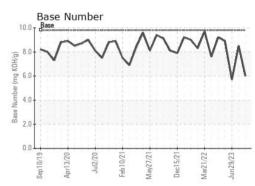
FLUID PROPE	RTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.7	14.1	13.9

## **GRAPHS**













Certificate L2367

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

: GFL0085230 : 06060821 : 10832203

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 16 Jan 2024 Diagnosed : 17 Jan 2024

Diagnostician : Wes Davis

GFL Environmental - 035 - Greensboro

1236 Elon Place High Point, NC US 27263

Contact: JORGE COSTA jorge.costa@gflenv.com T: (336)668-3712

To discuss this sample report, contact Customer Service at 1-800-237-1369. \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

F: