

# **OIL ANALYSIS REPORT**

Sample Rating Trend

GLYCOL

Machine Id **928065-205250** 

Component

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (--- GAL)

# **DIAGNOSIS**

### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

## Contamination

Sodium and/or potassium levels are high. Test for glycol is negative.

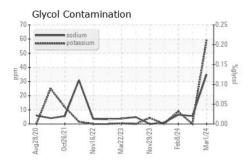
#### **Fluid Condition**

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

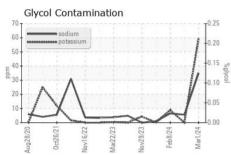
SAMPLE INFORMATION   method   limit/base   current   history1   history2	GAL)		Aug2020	Oct2021 Nov2022	Mar2023 Nov2023 Feb2024	Mar2024	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age	Sample Number		Client Info		GFL0109253	GFL0109313	GFL0109274
Oil Age         hrs         Client Info         324         653         157           Oil Changed Sample Status         Client Info         Not Changd ABNORMAL         Not Changd Not Cha	Sample Date		Client Info		01 Mar 2024	20 Feb 2024	08 Feb 2024
Oil Changed Sample Status	Machine Age	hrs	Client Info		32488	32418	32319
ABNORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		324	653	157
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Fuel	Sample Status				ABNORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10         6         0           Chromium         ppm         ASTM D5185m         >20         <1         <1         0           Nickel         ppm         ASTM D5185m         >4         <1         2         0           Silver         ppm         ASTM D5185m         >3         0         0         0           Aluminum         ppm         ASTM D5185m         >30         0         0         0           Aluminum         ppm         ASTM D5185m         >40         <1         0         1           Copper         ppm         ASTM D5185m         >40         <1         0         1           Cadd         ppm         ASTM D5185m         >15         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10         6         0           Chromium         ppm         ASTM D5185m         >20         <1	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Iron	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1         <1         0           Nickel         ppm         ASTM D5185m         >4         <1         2         0           Titanium         ppm         ASTM D5185m         >3         0         0         0           Silver         ppm         ASTM D5185m         >20         2         1         1         1         1         1         1         1         3         3         3 </td <td>WEAR METALS</td> <td>3</td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>	WEAR METALS	3	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	10	6	0
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Silver	Nickel	ppm	ASTM D5185m	>4	<1	2	0
Aluminum         ppm         ASTM D5185m         >20         2         2         2           Lead         ppm         ASTM D5185m         >40         <1	Titanium	ppm	ASTM D5185m		17	<1	16
Lead         ppm         ASTM D5185m         >40         <1         0         1           Copper         ppm         ASTM D5185m         >330         8         2         0           Tin         ppm         ASTM D5185m         >15         <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         <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         <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	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >330         8         2         0           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	2	2	2
Tin ppm ASTM D5185m > 15 <1 <1 <1 <1  <1 <1  <1  <1  <1  <1	Lead	ppm	ASTM D5185m	>40	<1	0	1
Vanadium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         10         2         21           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0         0           Manganese         ppm         ASTM D5185m         0         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         0         <1         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         847         875         773            Calcium         ppm         ASTM D5185m         1070         1094         1001         1060            Phosphorus         ppm         ASTM D5185m         1270         1221         1003         1135           Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959	Copper	ppm	ASTM D5185m	>330	8	2	0
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         10         2         21           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         55         55         45           Manganese         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         55         55         45           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         55         55         45           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         847         875         773           Calcium         ppm         ASTM D5185m         1070         1094         1001         1060           Phosphorus         ppm         ASTM D5185m         1150         1055         939         952           Zinc         ppm         ASTM D5185m         1270         1221         1003         1135           Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         35         6         6         6           Potassium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D7844         <	Boron	ppm	ASTM D5185m	0	10	2	21
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         847         875         773           Calcium         ppm         ASTM D5185m         1070         1094         1001         1060           Phosphorus         ppm         ASTM D5185m         1150         1055         939         952           Zinc         ppm         ASTM D5185m         1270         1221         1003         1135           Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >20         59         0         9           Glycol         *ASTM D5185m         >20         NE	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         847         875         773           Calcium         ppm         ASTM D5185m         1070         1094         1001         1060           Phosphorus         ppm         ASTM D5185m         1150         1055         939         952           Zinc         ppm         ASTM D5185m         1270         1221         1003         1135           Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D5185m         >20         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844	Molybdenum	ppm	ASTM D5185m	60	55	55	45
Calcium         ppm         ASTM D5185m         1 070         1094         1 001         1 060           Phosphorus         ppm         ASTM D5185m         1 150         1055         939         952           Zinc         ppm         ASTM D5185m         1 270         1 221         1 003         1 135           Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D5185m         >20         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1055         939         952           Zinc         ppm         ASTM D5185m         1270         1221         1003         1135           Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D5185m         >20         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION         *ASTM D7414         <	Magnesium	ppm	ASTM D5185m	1010	847	875	773
Zinc         ppm         ASTM D5185m         1270         1221         1003         1135           Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D5185m         >20         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION         method	Calcium	ppm	ASTM D5185m	1070	1094	1001	1060
Sulfur         ppm         ASTM D5185m         2060         3490         2862         2959           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         35         6         6           Potassium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3	Phosphorus	ppm	ASTM D5185m	1150	1055	939	952
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         35         6         6           Potassium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3         13.5         13.5	Zinc	ppm	ASTM D5185m	1270	1221	1003	1135
Silicon         ppm         ASTM D5185m         >25         5         4         0           Sodium         ppm         ASTM D5185m         35         6         6           Potassium         ppm         ASTM D5185m         >20         59         0         9           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3         13.5         13.5	Sulfur	ppm	ASTM D5185m	2060	3490	2862	2959
Sodium         ppm         ASTM D5185m         35         6         6           Potassium         ppm         ASTM D5185m         >20         ▶ 59         0         9           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3         13.5         13.5	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         ▶ 59         0         9           Glycol         %         *ASTM D2982         NEG         NEG         NEG           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3         13.5         13.5	Silicon	ppm	ASTM D5185m	>25	5	4	0
Soot %	Sodium	ppm	ASTM D5185m		35	6	6
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3         13.5         13.5	Potassium	ppm	ASTM D5185m	>20	<b>59</b>	0	9
Soot %         %         *ASTM D7844 >3         0.2         0.2         0.1           Nitration         Abs/cm         *ASTM D7624 >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.0         17.6         17.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         13.3         13.5         13.5	Glycol	%	*ASTM D2982		NEG	NEG	NEG
Nitration         Abs/cm         *ASTM D7624         >20         6.2         5.8         5.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3         13.5         13.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.0         17.6         17.8           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         13.3         13.5         13.5	Soot %	%	*ASTM D7844	>3	0.2	0.2	0.1
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2513.313.513.5	Nitration	Abs/cm	*ASTM D7624	>20	6.2	5.8	5.6
Oxidation Abs/.1mm *ASTM D7414 >25 <b>13.3</b> 13.5 13.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.0	17.6	17.8
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.3	13.5	13.5
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.4	9.1	8.7



# **OIL ANALYSIS REPORT**



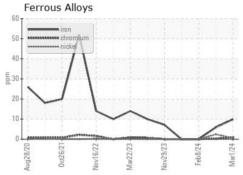
Visco	osity @	100°C				
18 - Abnor	mal					
17-						
0 16 Base 0 15 Passe		******				
§ 14-						
13 Abnor	mal	$\sim$				
11						
Aug28/20	Oct26/21	Nov16/22	Mar22/23	Nov29/23	Feb8/24	101
Aug	ő	S	M	N	<u></u>	2

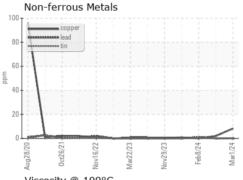


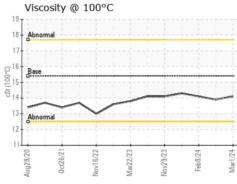
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

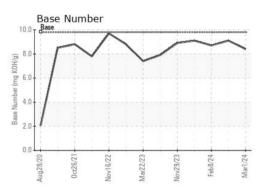
FLUID PROP	EKIIE2	method	ilmit/base	current	nistory i	nistoryz
Visc @ 100°C	cSt	ASTM D445	15.4	14.1	13.9	14.1

### **GRAPHS**













Laboratory Sample No. Lab Number : 06107260

: GFL0109253 Unique Number: 10910757

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

**Tested** Diagnosed Test Package: FLEET (Additional Tests: Glycol)

: 04 Mar 2024 : 06 Mar 2024

: 06 Mar 2024 - Jonathan Hester

GFL Environmental - 891 - Oklahoma City Hauling 1001 South Rockwell

Oklahoma City, OK US 73128

Contact: Andy Smith andrew.smith@gflenv.com T: (405)306-1651

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)

Report Id: GFL891 [WUSCAR] 06107260 (Generated: 03/06/2024 21:30:56) Rev: 1