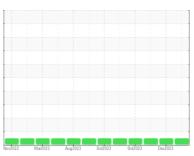


# **OIL ANALYSIS REPORT**

Sample Rating Trend



NORMAL



Machine Id 420110
Component

**Diesel Engine** 

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

# DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil

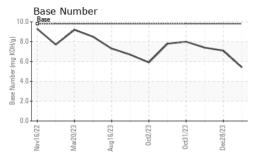
### **Fluid Condition**

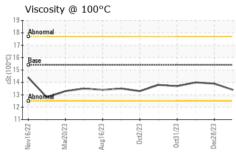
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number			c2023	Oct2023 Oct2023 D	Mar2023 Aug2023	Nov2022		GAL)
Sample Date	nistory2	hist	history1	current	limit/base	method	MATION	SAMPLE INFORM
Machine Age         hrs         Client Info         0         0         0         0           Oil Age         hrs         Client Info         600         0         0         0           Oil Changed         Client Info         Changed         Not Changed <th< th=""><th>0101099</th><th>GFL010</th><th>GFL0105570</th><th>GFL0099278</th><th></th><th>Client Info</th><th></th><th>Sample Number</th></th<>	0101099	GFL010	GFL0105570	GFL0099278		Client Info		Sample Number
Oil Age         hrs         Client Info         600         0         0           Oil Changed         Client Info         Changed         Not Changd         At         1 <td>ec 2023</td> <td>05 Dec 2</td> <td>28 Dec 2023</td> <th>06 Feb 2024</th> <td></td> <td>Client Info</td> <td></td> <td>Sample Date</td>	ec 2023	05 Dec 2	28 Dec 2023	06 Feb 2024		Client Info		Sample Date
Oil Changed Sample Status         Client Info         Changed NORMAL         Not Changed Normal         1.0         4         1.0         4.1 <t< td=""><td></td><td>0</td><td>0</td><th>0</th><td></td><td>Client Info</td><td>hrs</td><td>Machine Age</td></t<>		0	0	0		Client Info	hrs	Machine Age
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history1		0	0	600		Client Info	hrs	Oil Age
CONTAMINATION         method         limit/base         current         history1         In           Fuel         WC Method         >5         <1.0	Changd	Not Cha	Not Changd	Changed		Client Info		Oil Changed
Fuel	MAL	NORMA	NORMAL	NORMAL				Sample Status
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history1           Iron         ppm         ASTM D5185m         >110         16         11         7           Chromium         ppm         ASTM D5185m         >4         1         <1	nistory2	hist	history1	current	limit/base	method	ON	CONTAMINATI
Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         hi           Iron         ppm         ASTM D5185m         >110         16         11         7           Chromium         ppm         ASTM D5185m         >4         1         <1	.0	<1.0	<1.0	<1.0	>5	WC Method		Fuel
WEAR METALS	ΞG	NEG	NEG	NEG	>0.2	WC Method		Water
Iron	ΞG	NEG	NEG	NEG		WC Method		Glycol
Chromium         ppm         ASTM D5185m         >4         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         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	nistory2	hist	history1	current	limit/base	method	S	WEAR METALS
Nickel		7	11	16	>110	ASTM D5185m	ppm	Iron
Titanium         ppm         ASTM D5185m         0         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >25         4         2         3           Lead         ppm         ASTM D5185m         >45         5         <1         0           Copper         ppm         ASTM D5185m         >4         <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	>4	ASTM D5185m	ppm	Chromium
Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >25         4         2         3           Lead         ppm         ASTM D5185m         >45         5         <1         0           Copper         ppm         ASTM D5185m         >45         5         <1         <1         <1           Tin         ppm         ASTM D5185m         >4         <1         <1         <1         <1         <1           Vanadium         ppm         ASTM D5185m         >4         <1         0         <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		0	0	<1	>2	ASTM D5185m	ppm	Nickel
Aluminum         ppm         ASTM D5185m         >25         4         2         3           Lead         ppm         ASTM D5185m         >45         5         <1		0	<1	0		ASTM D5185m	ppm	Titanium
Lead		0	0	0	>2	ASTM D5185m	ppm	Silver
Copper         ppm         ASTM D5185m         >85         <1         <1         <1           Tin         ppm         ASTM D5185m         >4         <1		3	2	4	>25	ASTM D5185m	ppm	Aluminum
Tin         ppm         ASTM D5185m         >4         <1         <1         <1           Vanadium         ppm         ASTM D5185m         <         <1         0         <1           Cadmium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         hi           Boron         ppm         ASTM D5185m         0         19         30         37           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         60         68         68         65           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         431         351         382           Calcium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1270         1507         1219         125           Sulfur         ppm         ASTM D5185m         2060		0	<1	5	>45	ASTM D5185m	ppm	Lead
Vanadium         ppm         ASTM D5185m         <1         0         <1           Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         hi           Boron         ppm         ASTM D5185m         0         19         30         37           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         60         68         68         65           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         125           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history		<1	<1	<1	>85	ASTM D5185m	ppm	Copper
Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         hi           Boron         ppm         ASTM D5185m         0         19         30         37           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         68         68         65           Manganese         ppm         ASTM D5185m         0         <1		<1	<1	<1	>4	ASTM D5185m	ppm	Tin
ADDITIVES         method         limit/base         current         history1         hi           Boron         ppm         ASTM D5185m         0         19         30         37           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         68         68         65           Manganese         ppm         ASTM D5185m         1010         431         351         382           Calcium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         128           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         >20		<1	0	<1		ASTM D5185m	ppm	Vanadium
Boron         ppm         ASTM D5185m         0         19         30         37           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         68         68         65           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         431         351         382           Calcium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         129           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Soilicon         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         curre		<1	0	0		ASTM D5185m	ppm	Cadmium
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         68         68         65           Manganese         ppm         ASTM D5185m         0         <1	nistory2	hist	history1	current	limit/base	method		ADDITIVES
Molybdenum         ppm         ASTM D5185m         60         68         68         65           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         431         351         382           Calcium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         129           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5	7	37	30	19	0	ASTM D5185m	ppm	Boron
Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         431         351         382           Calcium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         128           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5         0.3         0.2		0	0	0	0	ASTM D5185m	ppm	Barium
Magnesium         ppm         ASTM D5185m         1010         431         351         382           Calcium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         128           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5         0.3         0.2	;	65	68	68	60	ASTM D5185m	ppm	Molybdenum
Calcium         ppm         ASTM D5185m         1070         2117         1696         176           Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         128           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         5         0         4           Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5         0.3         0.2		0	<1	<1	0	ASTM D5185m	ppm	Manganese
Phosphorus         ppm         ASTM D5185m         1150         1126         997         110           Zinc         ppm         ASTM D5185m         1270         1507         1219         128           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         5         0         4           Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5         0.3         0.2	32	382	351	431	1010	ASTM D5185m	ppm	Magnesium
Zinc         ppm         ASTM D5185m         1270         1507         1219         128           Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         5         0         4           Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         "ASTM D7844         >3         0.5         0.3         0.2	'66	1766	1696	2117	1070	ASTM D5185m	ppm	Calcium
Sulfur         ppm         ASTM D5185m         2060         3730         3420         358           CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         5         0         4           Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         "ASTM D7844         >3         0.5         0.3         0.2	00	1100	997	1126	1150	ASTM D5185m	ppm	Phosphorus
CONTAMINANTS         method         limit/base         current         history1         hi           Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         5         0         4           Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         %         *ASTM D7844         >3         0.5         0.3         0.2	298	1298	1219	1507	1270	ASTM D5185m	ppm	Zinc
Silicon         ppm         ASTM D5185m         >30         5         5         4           Sodium         ppm         ASTM D5185m         5         0         4           Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5         0.3         0.2	97	3597	3420	3730	2060	ASTM D5185m	ppm	Sulfur
Sodium         ppm         ASTM D5185m         5         0         4           Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5         0.3         0.2	nistory2	hist	history1	current	limit/base	method	TS	CONTAMINAN <sup>*</sup>
Potassium         ppm         ASTM D5185m         >20         2         3         3           INFRA-RED         method         limit/base         current         history1         hi           Soot %         *ASTM D7844         >3         0.5         0.3         0.2		4	5	5	>30	ASTM D5185m	ppm	Silicon
INFRA-RED         method         limit/base         current         history1         hi           Soot %         %         *ASTM D7844         >3 <b>0.5</b> 0.3         0.2		4	0	5		ASTM D5185m	ppm	Sodium
Soot % % *ASTM D7844 >3 <b>0.5</b> 0.3 0.2		3	3	2	>20	ASTM D5185m	ppm	Potassium
	nistory2	hist	history1	current	limit/base	method		INFRA-RED
	2	0.2	0.3	0.5	>3	*ASTM D7844	%	Soot %
Nitration Abs/cm *ASTM D7624 >20 <b>11.2</b> 9.9 9.0	0	9.0	9.9	11.2	>20	*ASTM D7624	Abs/cm	Nitration
<b>Sulfation</b> Abs/.1mm *ASTM D7415 >30 <b>23.5</b> 20.6 19.	1.6	19.6	20.6	23.5	>30	*ASTM D7415	Abs/.1mm	Sulfation
FLUID DEGRADATION method limit/base current history1 hi	nistory2	hist	history1	current	limit/base	method	ATION	FLUID DEGRAD
Oxidation Abs/.1mm *ASTM D7414 >25 <b>19.8</b> 16.8 16.	6.0	16.0	16.8	19.8	>25	*ASTM D7414	Abs/.1mm	Oxidation
<b>Base Number (BN)</b> mg KOH/g   ASTM D2896   9.8   <b>5.4</b>   7.1   7.4	4	7.4	7.1	5.4	9.8	ASTM D2896	mg KOH/g	Base Number (BN)



# **OIL ANALYSIS REPORT**

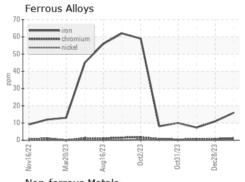


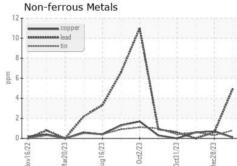


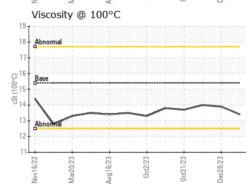
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

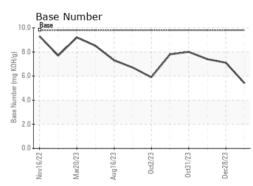
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.9	14.0

## **GRAPHS**













Certificate L2367

Laboratory Sample No.

: GFL0099278 Lab Number : 06104118 Unique Number : 10902348

To discuss this sample report, contact Customer Service at 1-800-237-1369.

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

**Tested** Diagnosed Test Package : FLEET

: 29 Feb 2024 : 29 Feb 2024 : 02 Mar 2024 - Don Baldridge

GFL Environmental - 846 - Mayfield Hauling 3426 State Route 45

Mayfield, KY US 42066 Contact: Jack Lindsey

jack.lindsey@gflenv.com T: (270)970-3690

\* - 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)