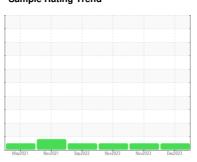


# **OIL ANALYSIS REPORT**

### Sample Rating Trend









**Diesel Engine** 

PETRO CANADA DURON SHP 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

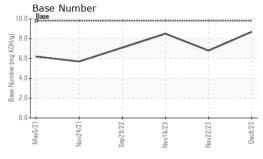
### **Fluid Condition**

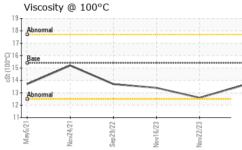
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION method   Imitibase   current   history1   history2			May2021	Nov2021 Sep2022	! Nov2023 Nov2023	Dec2023	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   12189   12051   12018   8959	·						GFL0101599
Oil Age         hrs         Client Info         12051         12018         8959           Oil Changed Sample Status         Client Info         Changed Not Changed Not Changed Not Changed Normal No	•						
Oil Changed Sample Status         Client Info         Changed NORMAL         Not Changed NORMAL         Changed NORMAL         NOR							
NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2	•	hrs					
CONTAMINATION	•		Client Info				Ü
Fuel   WC Method   S3.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1.0   <1	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         >5         <1         1         <1           Chromium         ppm         ASTM D5185m         >5         <1         1         <1           Nickel         ppm         ASTM D5185m         >4         0         0         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >10         0         0         0           Caddium         ppm         ASTM D5185m         0         <1         0         0           Cadmium         ppm         ASTM D5185m         0         <1         0	CONTAMINATI	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel				<1.0		
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         <1	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm			17	13	14
Titanium	Chromium	ppm	ASTM D5185m	>5	<1	1	<1
Stilver	Nickel	ppm	ASTM D5185m	>4		0	<1
Aluminum         ppm         ASTM D5185m         >15         2         2         1           Lead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         3         2         3           Tin         ppm         ASTM D5185m         >4         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         0         0           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Magnesium         ppm         ASTM D5185m         0         <1		ppm	ASTM D5185m	>2	0	<1	<1
Lead         ppm         ASTM D5185m         >25         0         0         0           Copper         ppm         ASTM D5185m         >100         3         2         3           Tin         ppm         ASTM D5185m         >4         0         0         0           Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         0           ADDITIVES         method         10         0         0         0         0           Barium	Silver	ppm					0
Copper         ppm         ASTM D5185m         >100         3         2         3           Tin         ppm         ASTM D5185m         >4         0         0         0           Vanadium         ppm         ASTM D5185m         0         <1	Aluminum	ppm		>15	2	2	1
Tin         ppm         ASTM D5185m         >4         0         0         0           Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         0           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         <1         0           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         947         802         833           Calcium         ppm         ASTM D5185m         1070         1058         911         995           Phosphorus         ppm         ASTM D5185m         1270         1311         1181	Lead	ppm	ASTM D5185m	>25	0	0	0
Vanadium         ppm         ASTM D5185m         0         <1         0           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         0           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         55         49         55           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         947         802         833           Calcium         ppm         ASTM D5185m         1070         1058         911         995           Phosphorus         ppm         ASTM D5185m         1270         1311         1181         1118           Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current<	Copper	ppm	ASTM D5185m	>100	3	2	3
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Tin	ppm	ASTM D5185m	>4	0	0	0
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         55         49         55           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         55         49         55           Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         947         802         833           Calcium         ppm         ASTM D5185m         1070         1058         911         995           Phosphorus         ppm         ASTM D5185m         1150         1083         827         948           Zinc         ppm         ASTM D5185m         1270         1311         1181         1118           Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         3         10         0           Potassium         ppm         ASTM D5185m         >20         <1         <1         2           Immitivation         Abs/cmm         *ASTM D7844	Boron	ppm	ASTM D5185m	0			
Manganese         ppm         ASTM D5185m         0         <1         <1         0           Magnesium         ppm         ASTM D5185m         1010         947         802         833           Calcium         ppm         ASTM D5185m         1070         1058         911         995           Phosphorus         ppm         ASTM D5185m         1150         1083         827         948           Zinc         ppm         ASTM D5185m         1270         1311         1181         1118           Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         >20         <1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.3           Nitration         Abs/cm         *ASTM D7815		ppm	ASTM D5185m	0			
Magnesium         ppm         ASTM D5185m         1010         947         802         833           Calcium         ppm         ASTM D5185m         1070         1058         911         995           Phosphorus         ppm         ASTM D5185m         1150         1083         827         948           Zinc         ppm         ASTM D5185m         1270         1311         1181         1118           Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         3         10         0           Potassium         ppm         ASTM D5185m         >20         <1	-	• •					
Calcium         ppm         ASTM D5185m         1070         1058         911         995           Phosphorus         ppm         ASTM D5185m         1150         1083         827         948           Zinc         ppm         ASTM D5185m         1270         1311         1181         1118           Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         >20         <1	· ·	ppm	ASTM D5185m	0	<1		
Phosphorus         ppm         ASTM D5185m         1150         1083         827         948           Zinc         ppm         ASTM D5185m         1270         1311         1181         1118           Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         >20         <1	Magnesium	ppm					
Zinc         ppm         ASTM D5185m         1270         1311         1181         1118           Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         3         10         0           Potassium         ppm         ASTM D5185m         >20         <1		ppm		1070			
Sulfur         ppm         ASTM D5185m         2060         3222         2659         2894           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         3         10         0           Potassium         ppm         ASTM D5185m         >20         <1	•	ppm					
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         3         10         0           Potassium         ppm         ASTM D5185m         >20         <1	-	ppm					
Silicon         ppm         ASTM D5185m         >25         4         10         3           Sodium         ppm         ASTM D5185m         3         10         0           Potassium         ppm         ASTM D5185m         >20         <1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.8         6.4         6.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.5         18.7           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         14.8         14.1			ASTM D5185m	2060	3222	2659	2894
Sodium         ppm         ASTM D5185m         3         10         0           Potassium         ppm         ASTM D5185m         >20         <1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         <1         <1         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.8         6.4         6.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.5         18.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         14.8         14.1		• •		>25			
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >6         0.3         0.3         0.3           Nitration         Abs/cm         *ASTM D7624         >20         6.8         6.4         6.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.5         18.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         14.8         14.1	Sodium	ppm	ASTM D5185m		3	10	0
Soot %         %         *ASTM D7844 >6         0.3         0.3         0.3           Nitration         Abs/cm         *ASTM D7624 >20         6.8         6.4         6.4           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.5         19.5         18.7           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.3         14.8         14.1	Potassium	ppm	ASTM D5185m	>20	<1	<1	2
Nitration         Abs/cm         *ASTM D7624         >20         6.8         6.4         6.4           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.5         18.7           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         14.8         14.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.5         19.5         18.7           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.3         14.8         14.1	Soot %	%	*ASTM D7844	>6	0.3	0.3	0.3
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     14.3     14.8     14.1	Nitration	Abs/cm	*ASTM D7624	>20	6.8	6.4	6.4
Oxidation Abs/.1mm *ASTM D7414 >25 <b>14.3</b> 14.8 14.1	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.5	19.5	18.7
	FLUID DEGRAD	OATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         9.8         8.7         6.8         8.5	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.3	14.8	14.1
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.7	6.8	8.5



## **OIL ANALYSIS REPORT**

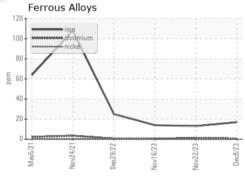


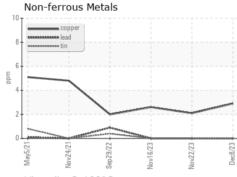


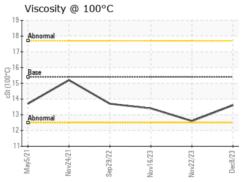
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

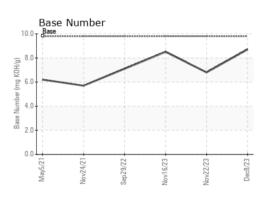
FLUID PROPE	EKIIES	method	ilmivbase		nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	13.6	12.6	13.4

### **GRAPHS**











Certificate L2367

Laboratory Sample No. Lab Number Unique Number : 10782037 Test Package : FLEET

: GFL0105576 : 06032246

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 12 Dec 2023 Diagnosed Diagnostician : Wes Davis

: 13 Dec 2023

GFL Environmental - 415 - Michigan East 6200 Elmridge

Sterling Heights, MI US 48313 Contact: Frank Wolak fwolak@gflenv.com T: (586)825-9514

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)