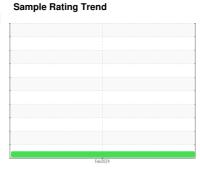


# **OIL ANALYSIS REPORT**

DT :



NORMAL



Freightliner
Component

**Diesel Engine** 

PETRO CANADA 15W40 (--- GAL)

## DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

#### Wear

Metal levels are typical for a new component breaking in.

#### Contamination

There is no indication of any contamination in the

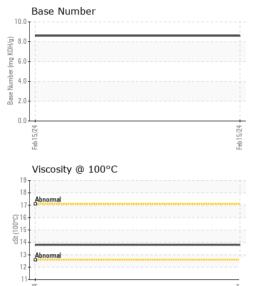
### **Fluid Condition**

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							
Sample Number					Feb 2024		
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Date   Client Info   15 Feb 2024	Sample Number		Client Info		GFL0109501		
Machine Age         hrs         Client Info         600			Client Info		15 Feb 2024		
Oil Changed Sample Status         Client Info         Changed NORMAL	•	hrs	Client Info		17300		
Sample Status	Oil Age	hrs	Client Info		600		
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0             Water         WC Method         >0.2         NEG             Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10             Chromium         ppm         ASTM D5185m         >4         0             Nickel         ppm         ASTM D5185m         >4         0             Silver         ppm         ASTM D5185m         >3         0             Lead         ppm         ASTM D5185m         >40         0             Copper         ppm         ASTM D5185m         >330         <1             Vanadium         ppm         ASTM D5185m         0              Va	Oil Changed		Client Info		Changed		
Fuel   WC Method   S5   C1.0   C	Sample Status				NORMAL		
Water         WC Method         >0.2         NEG             Glycol         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10             Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0		
WEAR METALS	Water		WC Method	>0.2	NEG		
Iron	Glycol		WC Method		NEG		
Chromium         ppm         ASTM D5185m         >20         <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	10		
Titanium         ppm         ASTM D5185m         0             Silver         ppm         ASTM D5185m         >20         2             Aluminum         ppm         ASTM D5185m         >20         2             Lead         ppm         ASTM D5185m         >40         0             Copper         ppm         ASTM D5185m         >330         <1	Chromium	ppm	ASTM D5185m	>20			
Silver	Nickel	ppm		>4	0		
Aluminum		ppm			-		
Lead	Silver	ppm		>3	0		
Copper         ppm         ASTM D5185m         >330         <1             Tin         ppm         ASTM D5185m         >15         <1		ppm		>20			
Tin         ppm         ASTM D5185m         >15         <1             Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         41             Barium         ppm         ASTM D5185m         0             Molybdenum         ppm         ASTM D5185m         54             Manganese         ppm         ASTM D5185m         642             Magnesium         ppm         ASTM D5185m         642             Calcium         ppm         ASTM D5185m         1507             Phosphorus         ppm         ASTM D5185m         849             Sulfur         ppm         ASTM D5185m         2689             Sulfur         ppm         ASTM D5185m         25 <td></td> <td></td> <td></td> <td></td> <th>_</th> <td></td> <td></td>					_		
Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         41             Barium         ppm         ASTM D5185m         0             Molybdenum         ppm         ASTM D5185m         54             Manganese         ppm         ASTM D5185m         <-1             Magnesium         ppm         ASTM D5185m         642             Calcium         ppm         ASTM D5185m         1507             Phosphorus         ppm         ASTM D5185m         849             Zinc         ppm         ASTM D5185m         2689             Sulfur         ppm         ASTM D5185m         >25         5             CONTAMINANTS         method         limit/base         current         <							
Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         41             Barium         ppm         ASTM D5185m         0             Molybdenum         ppm         ASTM D5185m         54             Manganese         ppm         ASTM D5185m         642             Magnesium         ppm         ASTM D5185m         1507             Calcium         ppm         ASTM D5185m         849             Phosphorus         ppm         ASTM D5185m         2689             Zinc         ppm         ASTM D5185m         2689             Sulfur         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         >20         5             Potassium         ppm         ASTM D5185m				>15			
ADDITIVES							
Boron   ppm   ASTM D5185m   Q		ppm	ASTM D5185m		0		
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         54             Manganese         ppm         ASTM D5185m         <1             Magnesium         ppm         ASTM D5185m         642             Calcium         ppm         ASTM D5185m         1507             Phosphorus         ppm         ASTM D5185m         849             Zinc         ppm         ASTM D5185m         2689             Sulfur         ppm         ASTM D5185m         2689             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         >20         5             Potassium         ppm         ASTM D7844         >3         0.1             INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7844	Boron	ppm	ASTM D5185m		41		
Manganese         ppm         ASTM D5185m         <1             Magnesium         ppm         ASTM D5185m         642             Calcium         ppm         ASTM D5185m         1507             Phosphorus         ppm         ASTM D5185m         849             Zinc         ppm         ASTM D5185m         1038             Sulfur         ppm         ASTM D5185m         2689             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26              Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         6.4             Sulfation	Barium	ppm	ASTM D5185m		0		
Magnesium         ppm         ASTM D5185m         642             Calcium         ppm         ASTM D5185m         1507             Phosphorus         ppm         ASTM D5185m         849             Zinc         ppm         ASTM D5185m         1038             Sulfur         ppm         ASTM D5185m         2689             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26              Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7415         >30         18.7	Molybdenum	ppm			54		
Calcium         ppm         ASTM D5185m         1507             Phosphorus         ppm         ASTM D5185m         849             Zinc         ppm         ASTM D5185m         1038             Sulfur         ppm         ASTM D5185m         2689             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2	-	ppm					
Phosphorus         ppm         ASTM D5185m         849             Zinc         ppm         ASTM D5185m         1038             Sulfur         ppm         ASTM D5185m         2689             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1	<u> </u>	ppm					
Zinc         ppm         ASTM D5185m         1038             Sulfur         ppm         ASTM D5185m         2689             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/.mm         *ASTM D7624         >20         6.4             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8		ppm					
Sulfur         ppm         ASTM D5185m         2689             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8		ppm					
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8							
Silicon         ppm         ASTM D5185m         >25         5             Sodium         ppm         ASTM D5185m         26             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8		• •			2689		
Sodium         ppm         ASTM D5185m         26             Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8		ITS	method	limit/base		history1	history2
Potassium         ppm         ASTM D5185m         >20         5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8				>25			
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8							
Soot %         %         *ASTM D7844         >3         0.1             Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION method limit/base current         bistory1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8		ppm	ASTM D5185m	>20	5		
Nitration         Abs/cm         *ASTM D7624         >20         6.4             Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.7             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.8				>3			
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 14.8				>20			
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.7		
	FLUID DEGRAI	OATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 8.6	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.8		
	Base Number (BN)	mg KOH/g	ASTM D2896		8.6		



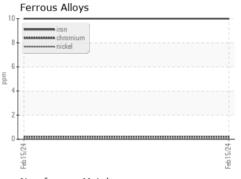
# **OIL ANALYSIS REPORT**



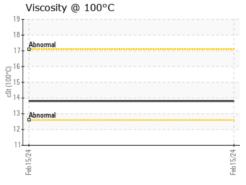
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE		
Yellow Metal	scalar	*Visual	NONE	NONE		
Precipitate	scalar	*Visual	NONE	NONE		
Silt	scalar	*Visual	NONE	NONE		
Debris	scalar	*Visual	NONE	NONE		
Sand/Dirt	scalar	*Visual	NONE	NONE		
Appearance	scalar	*Visual	NORML	NORML		
Odor	scalar	*Visual	NORML	NORML		
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG		
Free Water	scalar	*Visual		NEG		
FLUID PROPE	RTIES	method	limit/base	current	historv1	history2

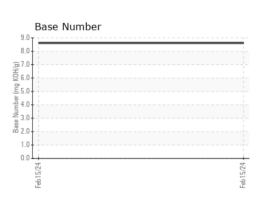
I LOID I NOI	LITTLO	memou		Thistory i	HISTOLYZ
Visc @ 100°C	cSt	ASTM D445	13.8		

### **GRAPHS**



<sup>10</sup> T	Non-ferrous Metals	
8 -	copper	
6 -		
4		
2 -		
0		***************************************
	Feb 15/24	201011







Certificate L2367

Laboratory Sample No.

Lab Number : 06095339 **Unique Number** : 10888192 Test Package : FLEET

: GFL0109501

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 21 Feb 2024 Tested : 22 Feb 2024 Diagnosed

: 22 Feb 2024 - Wes Davis

GFL Environmental - 019 - Greenville/TriEast

415 Staton Road Greenville, NC US 27834

Contact: Gerald Fowler gfowler@gflenv.com

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)

T:

F: