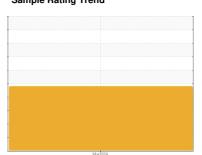


# **OIL ANALYSIS REPORT**

Sample Rating Trend



**GLYCOL** 



STERLING 223076

Component

**Diesel Engine** 

SHELL ROTELLA T 15W40 (--- GAL)

### **DIAGNOSIS**

#### Recommendation

We advise that you check for the source of the coolant leak. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

#### Wear

All component wear rates are normal.

#### Contamination

Test for glycol is positive. There is a moderate concentration of glycol present in the oil.

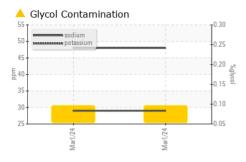
#### Fluid Condition

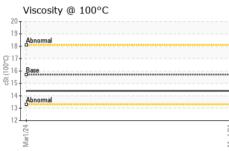
The oil is no longer serviceable due to the presence of contaminants.

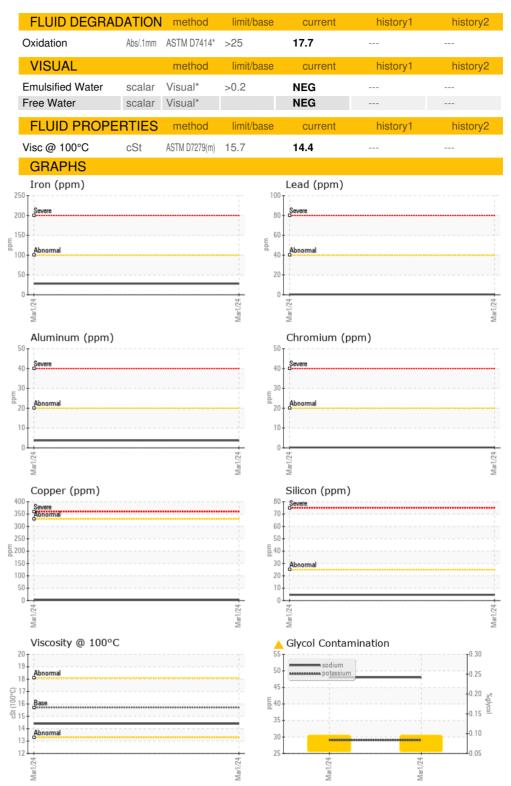
SAMPLE INFORMATION method   limit/bass   current   history1   history2					Mar2024			
Sample Number   Client Info   GFL0109558	CAMDLE INFODM	IATION	mothod			historya	history?	
Sample Date   Client Info   01 Mar 2024         Machine Age   hrs   Client Info   600         Oil Age   hrs   Client Info   600         Oil Changed   Client Info   Changed         Sample Status		IATION		IIIIII/base		nistory i	riistoryz	
Machine Age         hrs         Client Info         3175             Oil Changed         Client Info         600             Sample Status         Image: Client Info         ABNORMAL             Sample Status         Image: Client Info         ABNORMAL             CONTAMINATION         method         Imitibase         current         history1         history2           Fuel         WC Method         >5         <1.0								
Oil Age         hrs         Client Info         600             Oil Changed         Client Info         Changed             Sample Status         Imit Manage         ABNORMAL             CONTAMINATION         method         limit/base         current         history1         history2           Fruel         WC Method         >5         <1.0								
Oil Changed Sample Status         Client Info         Changed ABNORMAL								
CONTAMINATION	•	hrs						
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0			Client Info					
Fuel   WC Method   >5	Sample Status				ABNORMAL			
Water         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >100         28             Chromium         ppm         ASTM D5185(m)         >20         <1	CONTAMINATION	NC	method	limit/base	current	history1	history2	
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >100         28             Chromium         ppm         ASTM D5185(m)         >20         <1	Fuel		WC Method	>5	<1.0			
Iron	Water		WC Method	>0.2	NEG			
Chromium         ppm         ASTM D5185(m)         >20         <1	WEAR METALS	3	method	limit/base	current	history1	history2	
Chromium         ppm         ASTM D5185(m)         >20         <1             Nickel         ppm         ASTM D5185(m)         >4         <1	Iron	mqq	ASTM D5185(m)	>100	28			
Nickel	Chromium		. ,	>20	<1			
Titanium	Nickel		1 /		<1			
Silver	Titanium		ASTM D5185(m)		0			
Aluminum			( /	>3	-			
Lead         ppm         ASTM D5185(m)         >40         <1             Copper         ppm         ASTM D5185(m)         >330         2             Tin         ppm         ASTM D5185(m)         >15         0             Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         35         113             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0             ADDITIVES         method         limit/base         current         history1         history2 <tr< td=""><td>Aluminum</td><td></td><td>( /</td><td>&gt;20</td><td>4</td><td></td><td></td></tr<>	Aluminum		( /	>20	4			
Copper         ppm         ASTM D5185(m)         >330         2             Tin         ppm         ASTM D5185(m)         >15         0             Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0             Barium         ppm         ASTM D5185(m)         0         0            Molybdenum         ppm         ASTM D5185(m)         0         0             Magnesium         ppm         ASTM D5185(m)         10         13             Calcium         ppm         ASTM D5185(m)         10         13             Phosphorus	Lead		1	>40	<1			
Tin         ppm         ASTM D5185(m)         >15         0             Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         0             Magnesium         ppm         ASTM D5185(m)         0         0             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1210         1116	Copper		. ,	>330	2			
Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         5             Magnesium         ppm         ASTM D5185(m)         0         0             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115          -			( /		0			
Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         0         0             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         0             Manganese         ppm         ASTM D5185(m)         0         0             Magnesium         ppm         ASTM D5185(m)         10         13             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115	Antimony		. ,		0			
Beryllium	•				0			
Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         35         113             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         0             Manganese         ppm         ASTM D5185(m)         0         0             Magnesium         ppm         ASTM D5185(m)         10         13             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         >25         5 <th col<="" td=""><td>Beryllium</td><td></td><td>, ,</td><td></td><td>0</td><td></td><td></td></th>	<td>Beryllium</td> <td></td> <td>, ,</td> <td></td> <td>0</td> <td></td> <td></td>	Beryllium		, ,		0		
Boron         ppm         ASTM D5185(m)         35         113             Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         5             Manganese         ppm         ASTM D5185(m)         0         0             Magnesium         ppm         ASTM D5185(m)         10         13             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1210         1116             Zinc         ppm         ASTM D5185(m)         3890         3115             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D	Cadmium		ASTM D5185(m)		0			
Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         5             Manganese         ppm         ASTM D5185(m)         10         13             Magnesium         ppm         ASTM D5185(m)         2340         2190             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1210         1116             Zinc         ppm         ASTM D5185(m)         3890         3115             Sulfur         ppm         ASTM D5185(m)         >25         5             Lithium         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >20         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         A	ADDITIVES		method	limit/base	current	history1	history2	
Barium         ppm         ASTM D5185(m)         0         0             Molybdenum         ppm         ASTM D5185(m)         0         5             Manganese         ppm         ASTM D5185(m)         10         13             Magnesium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1210         1116             Zinc         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         <1	Boron	mag	ASTM D5185(m)	35	113			
Molybdenum         ppm         ASTM D5185(m)         0         5             Manganese         ppm         ASTM D5185(m)         0         0             Magnesium         ppm         ASTM D5185(m)         10         13             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1110         972             Zinc         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         < 1              CONTAMINANTS         method         limit/base         current         history1         history2           Sodium         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >20         29             Glycol         %         AST			, ,		0			
Manganese         ppm         ASTM D5185(m)         0         0             Magnesium         ppm         ASTM D5185(m)         10         13             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1110         972             Zinc         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         >25         5             Lithium         ppm         ASTM D5185(m)         >25         5             Soliicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >20         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         A			. ,					
Magnesium         ppm         ASTM D5185(m)         10         13             Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1110         972             Zinc         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         3890         3115             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >20         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         ^3         0.096             INFRA-RED         method		• •	, ,					
Calcium         ppm         ASTM D5185(m)         2340         2190             Phosphorus         ppm         ASTM D5185(m)         1110         972             Zinc         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         <1								
Phosphorus         ppm         ASTM D5185(m)         1110         972             Zinc         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         < 1              CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >25         5             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7624*         >3         0             Nitration         Abs/cm         ASTM D7624*         >			. ,					
Zinc         ppm         ASTM D5185(m)         1210         1116             Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         < 1             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >20         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7624*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9	0.0.0.0		, ,					
Sulfur         ppm         ASTM D5185(m)         3890         3115             Lithium         ppm         ASTM D5185(m)         < 1             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >20         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         ▲ 0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7624*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9			. ,					
Lithium         ppm         ASTM D5185(m)         <1             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         >20         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         ^         0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9	-		( /		-			
Silicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9			. ,					
Silicon         ppm         ASTM D5185(m)         >25         5             Sodium         ppm         ASTM D5185(m)         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9	CONTAMINANT	ΓS	method	limit/base	current	history1	history2	
Sodium         ppm         ASTM D5185(m)         48             Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         ▲ 0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9					5			
Potassium         ppm         ASTM D5185(m)         >20         29             Glycol         %         ASTM D7922*         ▲ 0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9			. ,					
Glycol         %         ASTM D7922*         ▲ 0.096             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9			( )	>20				
Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9			. ,					
Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         7.9	INFRA-RED		method	limit/base	current	history1	history2	
<b>Nitration</b> Abs/cm ASTM D7624* >20 <b>7.9</b>		%						



## **OIL ANALYSIS REPORT**









CALA ISO 17025:2017 Accredited Laboratory

Laboratory

Sample No.

Lab Number : 02620422 Unique Number : 5737532 Test Package : MOB 1 ( Additional Tests: Glycol )

: GFL0109558 Received

Validity of results and interpretation are based on the sample and information as supplied.

: 07 Mar 2024 **Tested** : 07 Mar 2024 Diagnosed

: 07 Mar 2024 - Kevin Marson

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental Inc. - 536 - Fort frances Fire #174 Hwy 11/71 Fort Frances, ON CA P9A 3M2 Contact: Jodi Holden jholden@gflenv.com

To discuss this sample report, contact Customer Service at 1-800-268-2131. Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.

T: (807)274-6255