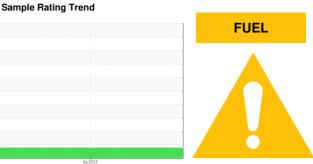


# **OIL ANALYSIS REPORT**



Machine Id

# **FREIGHTLINER 212246**

Diesel Engine

SAE 5W30 (--- GAL)

### DIAGNOSIS

### Recommendation

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

Metal levels are typical for a new component breaking in.

## Contamination

Light fuel dilution occurring. No other contaminants were detected in the oil.

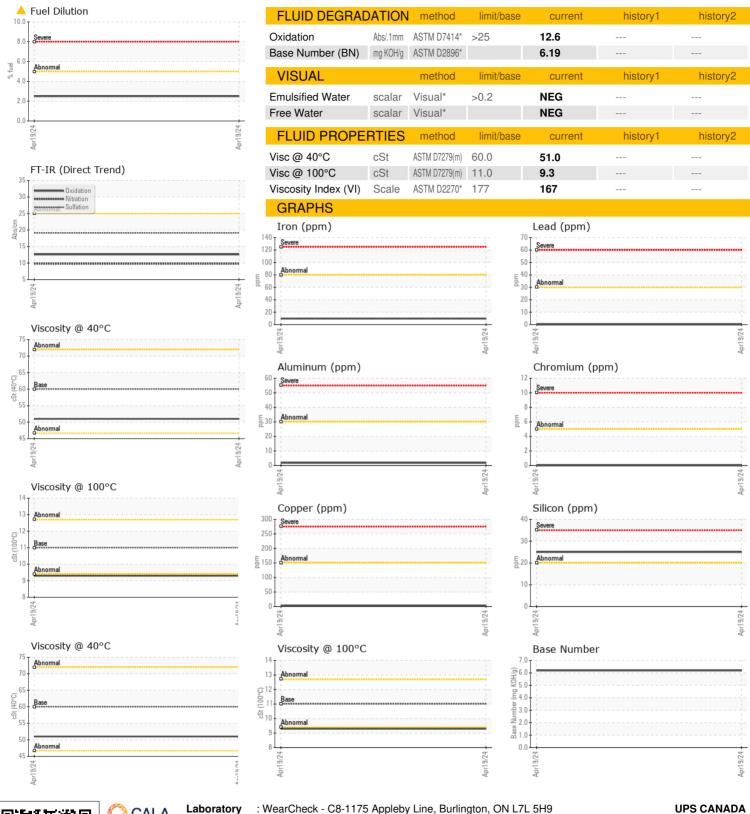
### **Fluid Condition**

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					Apr2024		
Sample Number   Client Info   PC0085533							
Sample Date   Client Info   19 Apr 2024         Machine Age   kms   Client Info   0   18800         Oil Age   kms   Client Info   0         Oil Changed   Client Info   N/A         Sample Status   MARGINAL         CONTAMINATION   method   limit/base   current   history1   history2     Water   WC Method   NEG         Glycol   WC Method   NEG         WEAR METALS   method   limit/base   current   history1   history2     Iron   ppm   ASTIN D5185(m)   >80   10         Chromium   ppm   ASTIN D5185(m)   >5   0         Nickel   ppm   ASTIN D5185(m)   >2   0         Silver   ppm   ASTIN D5185(m)   >30   2         Astin D5185(m)   >30   2         Copper   ppm   ASTIN D5185(m)   >30   0         Copper   ppm   ASTIN D5185(m)   >30   0         Copper   ppm   ASTIN D5185(m)   >5   0         Aluminum   ppm   ASTIN D5185(m)   >30   0         Copper   ppm   ASTIN D5185(m)   >5   0         Antimony   ppm   ASTIN D5185(m)   >5   0         Copper   ppm   ASTIN D5185(m)   >5   0         Antimony   ppm   ASTIN D5185(m)   >5   0         Antimony   ppm   ASTIN D5185(m)   >5   0         Antimony   ppm   ASTIN D5185(m)   0         Cadmium   ppm   ASTIN D5185(m)   0         ADDITIVES   method   limit/base   current   history1   history2     Boron   ppm   ASTIN D5185(m)   515         ADDITIVES   method   limit/base   current   history1   history2     ASTIN D5185(m)   515           ASTIN D5185(m)   515           ASTIN D5185(m)   515             ASTIN D5185(m)   515             ASTIN D5185(m)   515             ASTIN D5185(m)   515             ASTIN D5185(m)   515             ASTIN D5185(m)   515             ASTIN D5185(m)   515             ASTIN D5185(m)   515             Contamination   ppm   ASTIN D	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age         kms         Client Info         0             Oil Age         kms         Client Info         0             Oil Changed         Client Info         N/A             Sample Status         MARGINAL             CONTAMINATION         method         limil/base         current         history1         history2           Water         WC Method         NEG              Glycol         WC Method         Image: method limil/base         current         history1         history2           Iron         ppm         ASTM D5185/ml         >8.80         10             Iron         ppm         ASTM D5185/ml         >5         0             Iron         ppm         ASTM D5185/ml         >3         0             Iron         ppm         ASTM D5185/ml         >3         0             Iron         ppm         ASTM D5185/ml         >3         0             Iron         ppm         ASTM D5185/m	Sample Number		Client Info		PC0085533		
Oil Age         kms         Client Info         N/A            Oil Changed         Client Info         N/A            Sample Status         MARGINAL            CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >80         10             Chromium         ppm         ASTM D5185(m)         >5         0             Nickel         ppm         ASTM D5185(m)         >5         0             Silver         ppm         ASTM D5185(m)         >3         0             Lead         ppm         ASTM D5185(m)         >30         2             Vanadium         ppm         ASTM D5185(m)         >5         0             ADDITIVES         method         limit/base         current         history1	Sample Date		Client Info		19 Apr 2024		
Oil Changed Sample Status         Client Info         N/A	Machine Age	kms	Client Info		18800		
Sample Status	-	kms	Client Info		0		
CONTAMINATION	Oil Changed		Client Info		N/A		
Water         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >80         10             Chromium         ppm         ASTM D5185(m)         >5         0             Nickel         ppm         ASTM D5185(m)         >2         0             Silver         ppm         ASTM D5185(m)         >2         0             Aluminum         ppm         ASTM D5185(m)         >30         2             Aluminum         ppm         ASTM D5185(m)         >30         0             Lead         ppm         ASTM D5185(m)         >30         0             Lead         ppm         ASTM D5185(m)         >5         0             Lead         ppm         ASTM D5185(m)         5         0             Lead         ppm         ASTM D5185(m)         0	-				MARGINAL		
Water         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >80         10             Chromium         ppm         ASTM D5185(m)         >5         0             Nickel         ppm         ASTM D5185(m)         >2         0             Silver         ppm         ASTM D5185(m)         >2         0             Aluminum         ppm         ASTM D5185(m)         >30         2             Aluminum         ppm         ASTM D5185(m)         >30         0             Lead         ppm         ASTM D5185(m)         >30         0             Lead         ppm         ASTM D5185(m)         >5         0             Lead         ppm         ASTM D5185(m)         5         0             Lead         ppm         ASTM D5185(m)         0	CONTAMINATI	ON	method	limit/baco	current	hietory1	history2
WEAR METALS		OIN				History	HIStory
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185(m)         >80         10             Chromium         ppm         ASTM D5185(m)         >5         0             Nickel         ppm         ASTM D5185(m)         >2         0             Titanium         ppm         ASTM D5185(m)         >3         0             Aluminum         ppm         ASTM D5185(m)         >30         2             Lead         ppm         ASTM D5185(m)         >30         0             Copper         ppm         ASTM D5185(m)         >5         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Beryllium         ppm         ASTM D5185(m)         0				>0.2			
Iron	Glycol		WC Method		NEG		
Chromium   ppm   ASTM DS18S(m)   >5   0	WEAR METALS	S	method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185(m)         >5         0             Nickel         ppm         ASTM D5185(m)         >2         0             Titanium         ppm         ASTM D5185(m)         >3         0             Silver         ppm         ASTM D5185(m)         >30         2             Aluminum         ppm         ASTM D5185(m)         >30         0             Lead         ppm         ASTM D5185(m)         >30         0             Copper         ppm         ASTM D5185(m)         >5         0             Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         71	Iron	ppm	ASTM D5185(m)	>80	10		
Nickel	-		. ,		0		
Titanium         ppm         ASTM D5185(m)         0             Silver         ppm         ASTM D5185(m)         >3         0             Aluminum         ppm         ASTM D5185(m)         >30         2             Lead         ppm         ASTM D5185(m)         >30         0             Copper         ppm         ASTM D5185(m)         >5         0             Antimony         ppm         ASTM D5185(m)         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             Beryllium         ppm         ASTM D5185(m)         94             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm					-		
Silver							
Aluminum         ppm         ASTM D5185(m)         >30         2             Lead         ppm         ASTM D5185(m)         >30         0             Copper         ppm         ASTM D5185(m)         >150         3             Tin         ppm         ASTM D5185(m)         0             Antimony         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Vanadium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         0             Cadmium         ppm         ASTM D5185(m)         94             Boron         ppm         ASTM D5185(m)         94             Barium         ppm         ASTM D5185(m)         0             Molybdenum         ppm         ASTM D5185(m)         71             Magnesium         ppm         ASTM D5185(m)			( )	>3			
Lead         ppm         ASTM D5185(m)         >30         0             Copper         ppm         ASTM D5185(m)         >150         3             Tin         ppm         ASTM D5185(m)         >5         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)         94             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         94             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm<			( )				
Copper         ppm         ASTM D5185(m)         >150         3             Tin         ppm         ASTM D5185(m)         >5         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)         94             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         94              ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         71             Barium         p					_		
Tin ppm ASTM D5185(m) >5 0 Antimony ppm ASTM D5185(m) 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)         94             Barium         ppm         ASTM D5185(m)         0             Molybdenum         ppm         ASTM D5185(m)         71             Magnesium         ppm         ASTM D5185(m)         515             Magnesium         ppm         ASTM D5185(m)         587             Phosphorus         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         >20         2			\ /		_		
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)         94             Barium         ppm         ASTM D5185(m)         0             Molybdenum         ppm         ASTM D5185(m)         71             Magnese         ppm         ASTM D5185(m)         515             Magnesium         ppm         ASTM D5185(m)         587             Calcium         ppm         ASTM D5185(m)         745             Phosphorus         ppm         ASTM D5185(m)         2259             Sulfur         ppm         ASTM D5185(m)         <1             Lithium         ppm         ASTM D5185(m)         20         25 </td <td></td> <td></td> <td>. ,</td> <td>&gt;5</td> <td></td> <td></td> <td></td>			. ,	>5			
Beryllium	•				-		
Cadmium         ppm         ASTM D5185(m)         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185(m)         94             Barium         ppm         ASTM D5185(m)         0             Molybdenum         ppm         ASTM D5185(m)         71             Manganese         ppm         ASTM D5185(m)         515             Magnesium         ppm         ASTM D5185(m)         587             Calcium         ppm         ASTM D5185(m)         587             Phosphorus         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1			. ,				
ADDITIVES	,		( )		-		
Boron         ppm         ASTM D5185(m)         94             Barium         ppm         ASTM D5185(m)         0             Molybdenum         ppm         ASTM D5185(m)         71             Manganese         ppm         ASTM D5185(m)         515             Magnesium         ppm         ASTM D5185(m)         515             Calcium         ppm         ASTM D5185(m)         587             Phosphorus         ppm         ASTM D5185(m)         745             Zinc         ppm         ASTM D5185(m)         2259             Sulfur         ppm         ASTM D5185(m)         21             Lithium         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         >20         <1		ppm	. ,		U		
Barium         ppm         ASTM D5185(m)         0             Molybdenum         ppm         ASTM D5185(m)         71             Manganese         ppm         ASTM D5185(m)         515             Magnesium         ppm         ASTM D5185(m)         1197             Calcium         ppm         ASTM D5185(m)         587             Phosphorus         ppm         ASTM D5185(m)         745             Zinc         ppm         ASTM D5185(m)         2259             Sulfur         ppm         ASTM D5185(m)         21             Lithium         ppm         ASTM D5185(m)         >20         25             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         >20         <1             Fuel         %	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185(m)         71             Manganese         ppm         ASTM D5185(m)         <1             Magnesium         ppm         ASTM D5185(m)         515             Calcium         ppm         ASTM D5185(m)         1197             Phosphorus         ppm         ASTM D5185(m)         587             Zinc         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         >20         <1             Fuel         %         ASTM D7593*         >5         ^2         2.5             INFRA-RED	Boron	ppm	ASTM D5185(m)		94		
Manganese         ppm         ASTM D5185(m)         <1             Magnesium         ppm         ASTM D5185(m)         515             Calcium         ppm         ASTM D5185(m)         1197             Phosphorus         ppm         ASTM D5185(m)         587             Zinc         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1	Barium	ppm	ASTM D5185(m)		0		
Magnesium         ppm         ASTM D5185(m)         515             Calcium         ppm         ASTM D5185(m)         1197             Phosphorus         ppm         ASTM D5185(m)         587             Zinc         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1	Molybdenum	ppm	ASTM D5185(m)		71		
Calcium         ppm         ASTM D5185(m)         1197             Phosphorus         ppm         ASTM D5185(m)         587             Zinc         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1	Manganese	ppm	ASTM D5185(m)		<1		
Calcium         ppm         ASTM D5185(m)         1197             Phosphorus         ppm         ASTM D5185(m)         587             Zinc         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1	•		ASTM D5185(m)		515		
Phosphorus         ppm         ASTM D5185(m)         587             Zinc         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1	-		. ,		1197		
Zinc         ppm         ASTM D5185(m)         745             Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         >20         <1			\ /				
Sulfur         ppm         ASTM D5185(m)         2259             Lithium         ppm         ASTM D5185(m)         <1             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         >20         <1			. ,				
Lithium         ppm         ASTM D5185(m)         <1             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         2             Potassium         ppm         ASTM D5185(m)         >20         <1	-		( )		-		
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         2             Potassium         ppm         ASTM D5185(m)         >20         <1			. ,				
Silicon         ppm         ASTM D5185(m)         >20         25             Sodium         ppm         ASTM D5185(m)         2              Potassium         ppm         ASTM D5185(m)         >20         <1				limit/hase		history1	history2
Sodium         ppm         ASTM D5185(m)         2             Potassium         ppm         ASTM D5185(m)         >20         <1             Fuel         %         ASTM D7593*         >5         ▲ 2.5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         9.8							
Potassium         ppm         ASTM D5185(m)         >20         <1             Fuel         %         ASTM D7593*         >5         ▲ 2.5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         9.8			. ,	>20			
Fuel         %         ASTM D7593*         >5         ▲ 2.5             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         9.8			( )	. 20			
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         9.8		• •	. ,				
Soot %         %         ASTM D7844*         >3         0             Nitration         Abs/cm         ASTM D7624*         >20         9.8		70	49 INI D/283	>0	2.5		
Nitration         Abs/cm         ASTM D7624*         >20         9.8	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	ASTM D7844*	>3	0		
	Nitration	Abs/cm	ASTM D7624*	>20	9.8		
	Sulfation	Abs/.1mm	ASTM D7415*	>30			



## **OIL ANALYSIS REPORT**





CALA ISO 17025:2017 Accredited Laboratory

Laboratory Sample No.

: PC0085533 Lab Number : 02632531 Unique Number : 5773684

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 Received :01 May 2024

**Tested** : 02 May 2024 Diagnosed Test Package : MOB 2 ( Additional Tests: FuelDilution, KV40, PercentFuel, VI )

: 02 May 2024 - Wes Davis

2900 STEELES AVE W CONCORD, ON CA L4K 3S2 Contact: Service Manager

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.

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

T: F: