

# **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL



Area **{UNASSIGNED}** Machine Id **Freightliner** Component Discosed Engine

Diesel Engine

### PETRO CANADA 15W40 (--- GAL)

## Recommendation

Resample at the next service interval to monitor.

#### Wear

Metal levels are typical for a new component breaking in.

#### Contamination

There is no indication of any contamination in the oil.

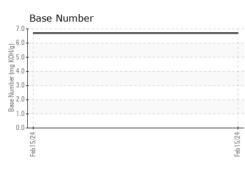
#### Fluid Condition

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

Sample Date      Client Info      15 Feb 2024          Adachine Age      hrs      Client Info      1973          Dil Age      hrs      Client Info      1973          Sil Changed      Client Info      Sil	0 ( GAL)				Feb2024		
Sample Date      Client Info      15 Feb 2024          Aachine Age      hrs      Client Info      1973          Sil Age      hrs      Client Info      1973          Sil Changed      Client Info      1973          Sample Status      Client Info      1973          CONTAMINATION      method      Imit/base      current      history1      history2        Vuel      WC Method      >3.0      <1.0          Aycol      WC Method      >0.2      NEG          WART METALS      method      imit/base      current      history1      history2        Von      ppm      ASTM D5165m      >4      0          Silver      ppm      ASTM D5165m      >20      0          Silver      ppm      ASTM D5165m      >20      0          Silver      ppm      ASTM D5165m      >20	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Atachine Age      hrs      Client Info      1973          Dil Age      hrs      Client Info      1973          Dil Changed      Client Info      1973          Soli Changed      Client Info      1973          Soli Changed      Client Info      1973          Sample Status      Info      NoRMAL          QONTAMINATION      method      Soli Changed          Vater      WC Method      >0.2      NEG          Water      WC Method      >10      2          Sharonium      ppm      ASTM D5165m<>10      2          Schoronium      ppm      ASTM D5165m<>20      0          Schoronium      ppm      ASTM D5165m<>20      0          Schoronium      ppm      ASTM D5165m<>20      0          Agandium      ppm	Sample Number		Client Info		GFL0109500		
Dil Age      hrs      Client Info      1973          Sample Status      Client Info      Changed          CONTAMINATION      method      limit/base      current      history1      history2        Suel      WC Method      >3.0      <1.0	Sample Date		Client Info		15 Feb 2024		
Dil Changed      Client Info      Changed          GONTAMINATION      method      limit/base      current      history1      history2        Yater      WC Method      >3.0      <1.0	Achine Age	hrs	Client Info		1973		
Sample Status      NORMAL          CONTAMINATION      method      limit/base      current      history1      history2        Suel      WC Method      >3.0      <1.0	Dil Age	hrs	Client Info		1973		
CONTAMINATION      method      imit/base      current      history1      history2        Suel      WC Method      >3.0      <1.0	Dil Changed		Client Info		Changed		
uel      WC Method      >3.0      <1.0          Water      WC Method      >0.2      NEG          Blycol      WC Method      NEG          WEAR METALS      method      limit/base      current      history1      history2        orn      ppm      ASTM D5185m      >10      2          tickel      ppm      ASTM D5185m      >2      0          tickel      ppm      ASTM D5185m      >2      0          tickel      ppm      ASTM D5185m      >2      0          tickel      ppm      ASTM D5185m      >20      4          silver      ppm      ASTM D5185m      >20      0          tickal      ppm      ASTM D5185m      >20      0          ticanium      ppm      ASTM D5185m      0	Sample Status				NORMAL		
Vater      WC Method      >0.2      NEG          Shycol      WC Method      Iimit/base      current      history1      history2        VEAR METALS      method      Iimit/base      current      history1         Shycol      ASTM D5185m      >130      55          Shycol      ppm      ASTM D5185m      >4      0          Shycol      ppm      ASTM D5185m      >2      0          Shyce      ppm      ASTM D5185m      >2      0          Need      ppm      ASTM D5185m      >20      0          Wuminum      ppm      ASTM D5185m      >20      0          Need      ppm      ASTM D5185m      >20      0	CONTAMINAT	ION	method	limit/base	current	history1	history2
Bilycol      WC Method      NEG         WEAR METALS      method      limit/base      current      history1      history2        oron      ppm      ASTM D5165m      >10      2          bickel      ppm      ASTM D5165m      >4      0          bikkel      ppm      ASTM D5165m      >2      0          bikker      ppm      ASTM D5165m      >2      0          cead      ppm      ASTM D5165m      0           Admadium      ppm      ASTM D5165m      4           Admadium      ppm      ASTM D5165m      0	uel		WC Method	>3.0	<1.0		
WEAR METALS      method      limit/base      current      history1      history2        formium      ppm      ASTM D5185m      >130      55          biromium      ppm      ASTM D5185m      >10      2          lickel      ppm      ASTM D5185m      >2      0          litker      ppm      ASTM D5185m      >2      0          silver      ppm      ASTM D5185m      >2      0          sead      ppm      ASTM D5185m      >2      0          cead      ppm      ASTM D5185m      >2      0          cadmium      ppm      ASTM D5185m      >4      -1          ADDITIVES      method      limit/base      current      history1      history2        Barium      ppm      ASTM D5185m      0           Aggnesium      ppm      ASTM D5185m      0	Vater		WC Method	>0.2	NEG		
ppm      ASTM D5185m      >130      55          Chromium      ppm      ASTM D5185m      >10      2          Lickel      ppm      ASTM D5185m      >2      0          Silver      ppm      ASTM D5185m      >2      0          Silver      ppm      ASTM D5185m      >2      0          Silver      ppm      ASTM D5185m      >2      0          Sopper      ppm      ASTM D5185m      >2      0          Gardmium      ppm      ASTM D5185m      >4      <1	alycol		WC Method		NEG		
Dromium      ppm      ASTM D5185m      >10      2          Lickel      ppm      ASTM D5185m      >4      0          Titanium      ppm      ASTM D5185m      >2      0          Silver      ppm      ASTM D5185m      >2      0          Vuminum      ppm      ASTM D5185m      >20      0          Sopper      ppm      ASTM D5185m      >20      0          Copper      ppm      ASTM D5185m      >20      0          Arradium      ppm      ASTM D5185m      >4      <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel      ppm      ASTM D5185m      >4      0          Silver      ppm      ASTM D5185m      >2      0          Numinum      ppm      ASTM D5185m      >2      0          Numinum      ppm      ASTM D5185m      >20      4          Sopper      ppm      ASTM D5185m      >20      0          Aranadium      ppm      ASTM D5185m      >12.5      2          Aranadium      ppm      ASTM D5185m      >4      <1	ron	ppm	ASTM D5185m	>130	55		
Titanium      ppm      ASTM D5185m      >2      0          Silver      ppm      ASTM D5185m      >2      0          Silver      ppm      ASTM D5185m      >20      4          Auminum      ppm      ASTM D5185m      >20      0          Copper      ppm      ASTM D5185m      >12.5      2          Anadium      ppm      ASTM D5185m      >12.5      2          Anadium      ppm      ASTM D5185m      >12.5      2          Anadium      ppm      ASTM D5185m      >12.5      2          Addmium      ppm      ASTM D5185m      0           Addium      ppm      ASTM D5185m      61	Chromium	ppm	ASTM D5185m	>10	2		
Silver      ppm      ASTM D5185m      >2      0          Numinum      ppm      ASTM D5185m      >20      4          Lead      ppm      ASTM D5185m      >20      0          Sopper      ppm      ASTM D5185m      >125      2          Yanadium      ppm      ASTM D5185m      >4      <1	lickel	ppm	ASTM D5185m	>4	0		
Numinum      ppm      ASTM D5185m      >20      4          eaad      ppm      ASTM D5185m      >20      0          Copper      ppm      ASTM D5185m      >125      2          Vanadium      ppm      ASTM D5185m      >4      <1	ītanium	ppm	ASTM D5185m	>2	0		
e.e.ad      ppm      ASTM D5185m      >20      0          Copper      ppm      ASTM D5185m      >12.5      2          Vanadium      ppm      ASTM D5185m      >4      <1	Silver	ppm	ASTM D5185m	>2	0		
Dopper      ppm      ASTM D5185m      >125      2          Tin      ppm      ASTM D5185m      >4      <1	luminum	ppm	ASTM D5185m	>20	4		
Inn      ppm      ASTM D5185m      >4      <1         Aranadium      ppm      ASTM D5185m      0          Cadmium      ppm      ASTM D5185m      0          ADDITIVES      method      limit/base      current      history1      history2        Boron      ppm      ASTM D5185m      4          ADUTIVES      method      limit/base      current      history1      history2        Boron      ppm      ASTM D5185m      61          Magnesium      ppm      ASTM D5185m      984          Magnesium      ppm      ASTM D5185m      984          Solcium      ppm      ASTM D5185m      1163          Soldium      ppm      ASTM D5185m      1331          Solfur      ppm      ASTM D5185m      >25      8          Solfur      ppm      ASTM D5185m      >20	ead	ppm	ASTM D5185m	>20	0		
ranadium      ppm      ASTM D5185m      0          Addmium      ppm      ASTM D5185m      0          ADDITIVES      method      limit/base      current      history1      history2        karnum      ppm      ASTM D5185m      4          Adolybdenum      ppm      ASTM D5185m      61          Maganese      ppm      ASTM D5185m      61          Maganese      ppm      ASTM D5185m      61          Magnesium      ppm      ASTM D5185m      984          Adagnesium      ppm      ASTM D5185m      984          Adagnesium      ppm      ASTM D5185m      1047          Adagnesium      ppm      ASTM D5185m      2891          GONTAMINANTS      method      limit/base      current      history1      history2        sodium      ppm      ASTM D5185m      >20	Copper	ppm	ASTM D5185m	>125	2		
AsadmiumppmASTM D5185m0ADDITIVESmethodlimit/basecurrenthistory1history2kariumppmASTM D5185m4MolybdenumppmASTM D5185m0MolybdenumppmASTM D5185m61MaganeseppmASTM D5185m61MaganeseppmASTM D5185m984MaganesumppmASTM D5185m984kaciumppmASTM D5185m1163bacloumppmASTM D5185m1047bacloumppmASTM D5185m1331bacloumppmASTM D5185m2891buffurppmASTM D5185m>258cONTAMINANTSmethodlimit/basecurrenthistory1history2billiconppmASTM D5185m>209INFRA-REDmethodlimit/basecurrenthistory1history2soot %%'ASTM D7844>61futrationAbs/cm'ASTM D745>3022.1futrationAbs/cm'ASTM D7415>3022.1futrationAbs/imm'ASTM D7414>2519.4futrationAbs/imm <td>ïn</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;4</td> <td>&lt;1</td> <td></td> <td></td>	ïn	ppm	ASTM D5185m	>4	<1		
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m4BariumppmASTM D5185m0MolybdenumppmASTM D5185m61ManganeseppmASTM D5185m984MagnesiumppmASTM D5185m984DatciumppmASTM D5185m1163CalciumppmASTM D5185m1047DincppmASTM D5185m1331SulfurppmASTM D5185m2891CONTAMINANTSmethodlimit/basecurrenthistory1history2SoliumppmASTM D5185m209INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>61INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>3022.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2DxidationAbs/.tmm*ASTM D7414>2519.4	/anadium	ppm	ASTM D5185m		0		
Boron      ppm      ASTM D5185m      4          Barium      ppm      ASTM D5185m      0          Molybdenum      ppm      ASTM D5185m      61          Manganese      ppm      ASTM D5185m      61          Manganese      ppm      ASTM D5185m      984          Manganese      ppm      ASTM D5185m      984          Calcium      ppm      ASTM D5185m      984          Calcium      ppm      ASTM D5185m      984          Calcium      ppm      ASTM D5185m      1047          Constantine      ppm      ASTM D5185m      2891          CONTAMINANTS      method      limit/base      current      history1      history2        Solicon      ppm      ASTM D5185m      >20      9          INFRA-RED      method      limit/base	Cadmium	ppm	ASTM D5185m		0		
Barium      ppm      ASTM D5185m      0         Aolybdenum      ppm      ASTM D5185m      61         Manganese      ppm      ASTM D5185m      61         Magnesium      ppm      ASTM D5185m      984         Calcium      ppm      ASTM D5185m      984         Calcium      ppm      ASTM D5185m      1163         Calcium      ppm      ASTM D5185m      1047         Phosphorus      ppm      ASTM D5185m      1331         Sulfur      ppm      ASTM D5185m      2891         CONTAMINANTS      method      limit/base      current      history1      history2        Solfur      ppm      ASTM D5185m      >25      8          CONTAMINANTS      method      limit/base      current      history1      history2        Solfur      ppm      ASTM D5185m      >20      9          INFRA-RED      method      limit/base	ADDITIVES		method	limit/base	current	history1	history2
Aolybdenum      ppm      ASTM D5185m      61          Manganese      ppm      ASTM D5185m      <1          Maggnesium      ppm      ASTM D5185m      984          Calcium      ppm      ASTM D5185m      984          Calcium      ppm      ASTM D5185m      1163          Calcium      ppm      ASTM D5185m      1047          Chosphorus      ppm      ASTM D5185m      1331          Sulfur      ppm      ASTM D5185m      2891          CONTAMINANTS      method      limit/base      current      history1      history2        Solicon      ppm      ASTM D5185m      >20      9          Solicon      ppm      ASTM D5185m      >20      9          Solicon      ppm      ASTM D5185m      >20      9          INFRA-RED      method <t< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td></td><td>4</td><td></td><td></td></t<>	Boron	ppm	ASTM D5185m		4		
Manganese      ppm      ASTM D5185m      <1          Magnesium      ppm      ASTM D5185m      984           Calcium      ppm      ASTM D5185m      1163           Phosphorus      ppm      ASTM D5185m      1047           Cinc      ppm      ASTM D5185m      1331           Sulfur      ppm      ASTM D5185m      2891           CONTAMINANTS      method      limit/base      current      history1      history2        Silicon      ppm      ASTM D5185m      >25      8          Sodium      ppm      ASTM D5185m      >20      9          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >6      1          Soot %      %      *ASTM D7844      >0      1	Barium	ppm	ASTM D5185m		0		
Magnesium      ppm      ASTM D5185m      984          Calcium      ppm      ASTM D5185m      1163          Phosphorus      ppm      ASTM D5185m      1047          Cinc      ppm      ASTM D5185m      1331          Sulfur      ppm      ASTM D5185m      2891          CONTAMINANTS      method      limit/base      current      history1      history2        Silicon      ppm      ASTM D5185m      >25      8          Sodium      ppm      ASTM D5185m      >20      9          Potassium      ppm      ASTM D5185m      >20      9          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >6      1          Intration      Abs/cm      *ASTM D7844      >3      22.1	lolybdenum	ppm	ASTM D5185m		61		
Calcium      ppm      ASTM D5185m      1163          Phosphorus      ppm      ASTM D5185m      1047          Sinc      ppm      ASTM D5185m      1331          Sulfur      ppm      ASTM D5185m      2891          CONTAMINANTS      method      limit/base      current      history1      history2        Solicon      ppm      ASTM D5185m      >25      8          CONTAMINANTS      method      limit/base      current      history1      history2        Solicon      ppm      ASTM D5185m      >25      8          CONTAMINANTS      method      limit/base      current      history1      history2        Solicon      ppm      ASTM D5185m      >20      9          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >6      1	langanese	ppm	ASTM D5185m		<1		
PhosphorusppmASTM D5185m1047SulfurppmASTM D5185m1331SulfurppmASTM D5185m2891CONTAMINANTSmethodlimit/basecurrenthistory1history2SoliumppmASTM D5185m>258SoliumppmASTM D5185m>258SoliumppmASTM D5185m>209PotassiumppmASTM D5185m>209INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>61INFRA-RED*ASTM D7844>61Soot %%*ASTM D7844>3022.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/:1mm*ASTM D7414>2519.4	lagnesium	ppm	ASTM D5185m		984		
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SulfurppmASTM D5185m2891CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>258SodiumppmASTM D5185m>209PotassiumppmASTM D5185m>209INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>61NitrationAbs/cm*ASTM D7624>2010.3SoulfationAbs/lmm*ASTM D7624>3022.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2519.4	Phosphorus	ppm	ASTM D5185m		1047		
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>258SodiumppmASTM D5185m3PotassiumppmASTM D5185m>209INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D5185m>209INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7624>2010.3SulfationAbs/cm*ASTM D7624>3022.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2DxidationAbs/1mm*ASTM D7414>2519.4	linc	ppm	ASTM D5185m		1331		
Silicon      ppm      ASTM D5185m      >25      8          Godium      ppm      ASTM D5185m      3           Potassium      ppm      ASTM D5185m      >20      9          INFRA-RED      method      limit/base      current      history1      history2        Goot %      %      *ASTM D7624      >20      10.3          Bulfation      Abs/cm      *ASTM D7624      >20      10.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.4	Sulfur	ppm	ASTM D5185m		2891		
Sodium      ppm      ASTM D5185m      3          Potassium      ppm      ASTM D5185m      >20      9          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >6      1          Nitration      Abs/cm      *ASTM D7844      >6      1          Soot %      %      *ASTM D7844      >6      1          Sulfation      Abs/cm      *ASTM D7624      >20      10.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.4	CONTAMINAN	NTS	method	limit/base	current	history1	history2
PotassiumppmASTM D5185m>209INFRA-REDmethodlimit/basecurrenthistory1history2Goot %%*ASTM D7844>61NitrationAbs/cm*ASTM D7624>2010.3GulfationAbs/.1mm*ASTM D7415>3022.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2519.4				>25	8		
INFRA-RED    method    limit/base    current    history1    history2      Soot %    %    *ASTM D7844    >6    1        Jitration    Abs/cm    *ASTM D7624    >20    10.3        Sulfation    Abs/.1mm    *ASTM D7415    >30    22.1        FLUID DEGRADATION    method    limit/base    current    history1    history2      Oxidation    Abs/.1mm    *ASTM D7414    >25    19.4	Sodium	ppm					
Soot %      %      *ASTM D7844      >6      1          Jitration      Abs/cm      *ASTM D7624      >20      10.3          Sulfation      Abs/.1mm      *ASTM D7415      >30      22.1          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.4	otassium	ppm	ASTM D5185m	>20	9		
Abs/cm      *ASTM D7624      >20      10.3          Sulfation      Abs/.1mm      *ASTM D7615      >30      22.1          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation    Abs/.1mm    *ASTM D7415    >30    22.1        FLUID DEGRADATION    method    limit/base    current    history1    history2      Oxidation    Abs/.1mm    *ASTM D7414    >25    19.4	Soot %			>6			
FLUID DEGRADATION  method  limit/base  current  history1  history2    Dxidation  Abs/.1mm  *ASTM D7414  >25  19.4	Nitration	Abs/cm	*ASTM D7624	>20	10.3		
Dxidation      Abs/.1mm      *ASTM D7414      >25      19.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.1		
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN)      mg KOH/g      ASTM D2896      6.7		Abs/.1mm	*ASTM D7414	>25	19.4		
	Base Number (BN)	mg KOH/g	ASTM D2896		6.7		



# **OIL ANALYSIS REPORT**



#### Viscosity @ 100°C



18

17

<del>္</del> 16

13

12 11-

Laboratory Sample No.

Lab Number : 06095338

Feb15/24

: GFL0109500

(100° 15 ぢ 14

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		
Emulsified Water	scalar	*Visual	>0.2	NEG		
Free Water	scalar	*Visual		NEG		
FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		13.7		
GRAPHS						
50 40 30 20 10 55 50 50 50 50 50 50 50 50 5			Feb 15/24			
Copper Sead Copper Lead Lead Copper Lead Le			Feb15/24			
Viscosity @ 100°C	C			Base Number	-	

7.0

6.0

(B/HO)

E 4.0

- e 3.0 ଛ 2.0

1.0

0.0

Feb15/24

Feb15/24.

: 21 Feb 2024

: 22 Feb 2024



Unique Number : 10888191 Diagnosed : 22 Feb 2024 - Wes Davis Test Package : FLEET Contact: Gerald Fowler Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. gfowler@gflenv.com \* - 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)

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

Received

Tested

GFL Environmental - 019 - Greenville/TriEast

Feb15/24

415 Staton Road

Greenville, NC

US 27834

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T:

F: