

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend







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Sample Number     Client Info     GFL0096944     GFL0096985     GFL0094247       Sample Date     Client Info     29 Jan 202     65 Dec 2023     19 May 2023       Machine Age     hrs     Client Info     13116     12733     11844       Oil Age     Client Info     13116     0     11844       Oil Age     No     Changed     NoRMAL     NORMAL       Sample Status     Imit Method     Imit Mass     NoRMAL     NORMAL       CONTAMINATION     method     Imit Mass     current     History1     History2       Water     WC Method     Imit Mass     current     History1     History2       Ino     ppm     ASTM 05185n     0     0     <1     1       Innaium     ppm     ASTM 05185n     0     0     0     1     1     1     9       Chromium     ppm     ASTM 05185n     0     0     0     1     1     1       Innaium     ppm     ASTM 05185n     1     2     <1     1	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age     hrs     Client Info     13116     12733     11844       Oil Age     hrs     Client Info     Not Changd     Not Changd     Changed       Sample Status     Imit Add     NorRMAL     NorRMAL     NorRMAL     NorRMAL       CONTAMINATION     method     Imit Imit Imit Imit Imit Imit Imit Imit	Sample Number		Client Info		GFL0096944	GFL0096985	GFL0084247
Oil Age Inss Client Info 13116 0 11844   Oil Changed Client Info Not Changd Not Changd Changed   Sample Status Imit base current Instory1 Instory2   Water WC Method NEG NEG NEG   Water WC Method NEG NEG NEG   WEAR METALS method Imit/base current Instory1 Instory2   Iron ppm ASTM D5185m <1	Sample Date		Client Info		29 Jan 2024	05 Dec 2023	19 May 2023
Oil Changed Sample StatusClient InfoNot Changd NORMALNot Changd NORMALChanged NORMALCONTAMINATIONmethodimit/basecurrenthistory1history2WaterWC MethodNEGNEGNEGWEAR METALSmethodimit/basecurrenthistory1IronppmASTM D5185m<1	Machine Age	hrs	Client Info		13116	12733	11844
Sample Status     NORMAL     NORMAL     NORMAL     NORMAL       CONTAMINATION     method     limit/base     current     history1     history2       Water     WC Method     NEG     NEG     NEG       WEAR METALS     method     imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     O     <1     1       Nickel     ppm     ASTM D5185m     O     O     <1       Silver     ppm     ASTM D5185m     O     O     <1       Silver     ppm     ASTM D5185m     O     O     O       Silver     ppm     ASTM D5185m     O     O     O       Copper     ppm     ASTM D5185m     C1     O     C1       Tin     ppm     ASTM D5185m     O     O     O     O       Cadmium     ppm     ASTM D5185m     C1     O     C1     O       Molybdenum     ppm     ASTM D5185m     41     T     8	Oil Age	hrs	Client Info		13116	0	11844
CONTAMINATIONmethodlimit/basecurrenthistory1history2WaterWC MethodNEGNEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM D5185m0<1	Oil Changed		Client Info		Not Changd	Not Changd	Changed
Water     WC Method     NEG     NEG     NEG       WEAR METALS     method     imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     <1	Sample Status				NORMAL	NORMAL	NORMAL
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Iron     ppm     ASTM D5185m     <1	Water		WC Method		NEG	NEG	NEG
Chromium     ppm     ASTM D5185m     0     <1     1       Nickel     ppm     ASTM D5185m     0     0     <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     0     0     <1       Titanium     ppm     ASTM D5185m     0     0     <1	Iron	ppm	ASTM D5185m		<1	14	9
Titanium     ppm     ASTM D5185m     0     0     <1       Silver     ppm     ASTM D5185m     0     0     0       Aluminum     ppm     ASTM D5185m     1     2     <1	Chromium	ppm	ASTM D5185m		0	<1	1
Silver     ppm     ASTM D5185m     0     0     0       Aluminum     ppm     ASTM D5185m     <1	Nickel	ppm	ASTM D5185m		0	0	<1
Atominum     ppm     ASTM D5185m     1     2     <1       Lead     ppm     ASTM D5185m     <1	Titanium	ppm	ASTM D5185m		0	0	<1
Lead     ppm     ASTM D5185m     <1     <1     <1     8       Copper     ppm     ASTM D5185m     0     <1	Silver	ppm	ASTM D5185m		0	0	0
Copper     ppm     ASTM D5185m     0     <1     1       Tin     ppm     ASTM D5185m     <1	Aluminum	ppm	ASTM D5185m		1	2	<1
Tin     ppm     ASTM D5185m     <1     0     <1       Vanadium     ppm     ASTM D5185m     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     41     7     8       Barium     ppm     ASTM D5185m     41     0     0       Molybdenum     ppm     ASTM D5185m     41     0     0       Magnese     ppm     ASTM D5185m     47     62     56       Magnesium     ppm     ASTM D5185m     550     612     648       Calcium     ppm     ASTM D5185m     730     822     257       Phosphorus     ppm     ASTM D5185m     868     1016     1096       Sulfur     ppm     ASTM D5185m     253     2575     2913       CONTAMINANTS     method     limit/base     current     history1     history2	Lead	ppm	ASTM D5185m		<1	<1	8
Vanadium     ppm     ASTM D5185m     0     0     0       Cadmium     ppm     ASTM D5185m     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     41     7     8       Barium     ppm     ASTM D5185m     41     7     8       Barium     ppm     ASTM D5185m     41     0     0       Molybdenum     ppm     ASTM D5185m     41     0     0       Maganese     ppm     ASTM D5185m     41     0     <1       Magnesium     ppm     ASTM D5185m     550     612     648       Calcium     ppm     ASTM D5185m     758     730     822       Zinc     ppm     ASTM D5185m     2533     2575     2913       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     5     6     7     2	Copper	ppm	ASTM D5185m		0	<1	1
CadmiumppmASTM D5185m000ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m4178BariumppmASTM D5185m4178BariumppmASTM D5185m476256ManganeseppmASTM D5185m476256MagnesiumppmASTM D5185m550612648CalciumppmASTM D5185m550612648CalciumppmASTM D5185m758730822ZincppmASTM D5185m225325752913CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m567SodiumppmASTM D5185m022INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%'ASTM D76246.211.711.9SulfationAbs/m'ASTM D76246.211.711.9SulfationAbs/m'ASTM D741519.023.027.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/Imm'ASTM D741415.018.523.0	Tin	ppm	ASTM D5185m		<1	0	<1
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m4178BariumppmASTM D5185m4100MolybdenumppmASTM D5185m476256ManganeseppmASTM D5185m476256MagnesiumppmASTM D5185m410<1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron     ppm     ASTM D5185m     41     7     8       Barium     ppm     ASTM D5185m     <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium     ppm     ASTM D5185m     <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     47     62     56       Manganese     ppm     ASTM D5185m     <1	Boron	ppm	ASTM D5185m		41	7	8
Maganese     ppm     ASTM D5185m     <1     0     <1       Magnesium     ppm     ASTM D5185m     550     612     648       Calcium     ppm     ASTM D5185m     1307     1493     1759       Phosphorus     ppm     ASTM D5185m     758     730     822       Zinc     ppm     ASTM D5185m     868     1016     1096       Sulfur     ppm     ASTM D5185m     2253     2575     2913       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     5     6     7       Sodium     ppm     ASTM D5185m     0     2     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0.1     0.1       Nitration     Abs/mm     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.1mm     *ASTM D7415     19.0     2	Barium	ppm	ASTM D5185m		<1	0	0
Magnesium     ppm     ASTM D5185m     550     612     648       Calcium     ppm     ASTM D5185m     1307     1493     1759       Phosphorus     ppm     ASTM D5185m     758     730     822       Zinc     ppm     ASTM D5185m     758     730     822       Zinc     ppm     ASTM D5185m     868     1016     1096       Sulfur     ppm     ASTM D5185m     2253     2575     2913       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     5     6     7       Sodium     ppm     ASTM D5185m     3     12     9       Potassium     ppm     ASTM D5185m     0     2     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.tmm     *ASTM D7415     19.0     23.0 <td>•</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th></th> <td></td> <td>56</td>	•	ppm	ASTM D5185m				56
Calcium     ppm     ASTM D5185m     1307     1493     1759       Phosphorus     ppm     ASTM D5185m     758     730     822       Zinc     ppm     ASTM D5185m     758     730     822       Zinc     ppm     ASTM D5185m     868     1016     1096       Sulfur     ppm     ASTM D5185m     2253     2575     2913       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     5     6     7       Sodium     ppm     ASTM D5185m     3     12     9       Potassium     pm     ASTM D5185m     0     2     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.1mm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current	Manganese	ppm	ASTM D5185m		<1	0	<1
Phosphorus     ppm     ASTM D5185m     758     730     822       Zinc     ppm     ASTM D5185m     868     1016     1096       Sulfur     ppm     ASTM D5185m     2253     2575     2913       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     5     6     7       Sodium     ppm     ASTM D5185m     3     12     9       Potassium     ppm     ASTM D5185m     0     2     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.1mm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414	0	ppm			550		648
ZincppmASTM D5185m86810161096SulfurppmASTM D5185m225325752913CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m567SodiumppmASTM D5185m3129PotassiumppmASTM D5185m022INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D784400.10.1NitrationAbs/cm*ASTM D76246.211.711.9SulfationAbs/.imm*ASTM D741519.023.027.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.imm*ASTM D741415.018.523.0	Calcium	ppm	ASTM D5185m		1307	1493	1759
SulfurppmASTM D5185m225325752913CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m567SodiumppmASTM D5185m3129PotassiumppmASTM D5185m022INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D784400.10.1NitrationAbs/cm*ASTM D76246.211.711.9SulfationAbs/limm*ASTM D741519.023.027.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D741415.018.523.0	Phosphorus	ppm			758		
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m567SodiumppmASTM D5185m3129PotassiumppmASTM D5185m022INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D784400.10.1NitrationAbs/cm*ASTM D76246.211.711.9SulfationAbs/.tmm*ASTM D741519.023.027.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.tmm*ASTM D741415.018.523.0	-	ppm	ASTM D5185m		868	1016	1096
Silicon     ppm     ASTM D5185m     5     6     7       Sodium     ppm     ASTM D5185m     3     12     9       Potassium     ppm     ASTM D5185m     0     2     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.imm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.imm     *ASTM D7414     15.0     18.5     23.0	Sulfur	ppm	ASTM D5185m		2253	2575	2913
Sodium     ppm     ASTM D5185m     3     12     9       Potassium     ppm     ASTM D5185m     0     2     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.1mm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     15.0     18.5     23.0	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium     ppm     ASTM D5185m     0     2     2       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.1mm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     15.0     18.5     23.0	Silicon	ppm	ASTM D5185m		5	6	7
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D784400.10.1NitrationAbs/cm*ASTM D76246.211.711.9SulfationAbs/.tmm*ASTM D741519.023.027.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.tmm*ASTM D741415.018.523.0	Sodium	ppm	ASTM D5185m		3	12	9
Soot %     %     *ASTM D7844     0     0.1     0.1       Nitration     Abs/cm     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.1mm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     15.0     18.5     23.0	Potassium	ppm	ASTM D5185m		0	2	2
Nitration     Abs/cm     *ASTM D7624     6.2     11.7     11.9       Sulfation     Abs/.1mm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     15.0     18.5     23.0			method	limit/base	current	history1	history2
Sulfation     Abs/.1mm     *ASTM D7415     19.0     23.0     27.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     15.0     18.5     23.0			methou				
FLUID DEGRADATION method limit/base current history1 history2   Oxidation Abs/.1mm *ASTM D7414 15.0 18.5 23.0		%			0	0.1	0.1
Oxidation     Abs/.1mm     *ASTM D7414     15.0     18.5     23.0	Soot %		*ASTM D7844				
	Soot % Nitration	Abs/cm	*ASTM D7844 *ASTM D7624	_	6.2	11.7	11.9
Base Number (BN)     mg KOH/g     ASTM D2896     8.2     4.8     3.5	Soot % Nitration Sulfation	Abs/cm Abs/.1mm	*ASTM D7844 *ASTM D7624 *ASTM D7415		6.2 19.0	11.7 23.0	11.9 27.1
	Soot % Nitration Sulfation FLUID DEGRAE	Abs/cm Abs/.1mm	*ASTM D7844 *ASTM D7624 *ASTM D7415 method		6.2 19.0 current	11.7 23.0 history1	11.9 27.1 history2

#### Area (P658099) Machine Id 3819C

Component Natural Gas Engine Fluid PETRO CANADA 10W40 (8 GAL)

## DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### 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.



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Dec31/18

Feb25/20

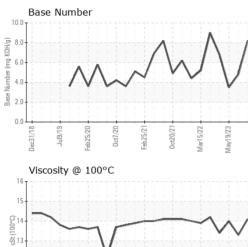
Jul9/19

# **OIL ANALYSIS REPORT**

scalar \*Visual

VISUAL

White Metal



	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
$( \land \land$	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
····V	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Feb 25/21 0ct20/21 Mar15/22 Aay19/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Feb 25/21 0ct20/21 Mar15/22 May19/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual		NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROPE		method	limit/base	current	history1	history2
$\sim \sim \sim$	Visc @ 100°C	cSt	ASTM D445		14.1	13.3	14.0
	GRAPHS						
	Ferrous Alloys						
21	iron						
Feb25/21 0ct20/21 Mar15/22 May19/23	80 - nickel						
Ma Mi O							
	60- E						
	40						
	1 1		A				
	20			-			
		<u>~</u>	~	-			
		5/21-	0/21-	9/23 .			
	Dec31/18 Jul9/19 Feb25/20	Uctr//zU Feb25/21	0ct20/21 Mar15/22	May 19/23			
	Non-ferrous Meta	als		-			
	<sup>25</sup> T	,					
	copper ]						
	20 - tin						
	15						
	udd						
	10						
				٨			
	5			1			
		AA		-			
	Dec31/18 Jul9/19 Feb25/20	Uct//2U Feb25/21	0ct20/21 Mar15/22	May 19/23			
	Pebi Ju	Teb Uc	0ct Mar	May			
	Viscosity @ 100°	С			Base Number		
	15.5	111111		10.0			
	15						Λ
	14.5			(B) 8.0		Λ	
C O	5125		$\sim$	8.0 6.0 Base Number (mg KOH/g) 4.0		()	1
000	B 13.5			er V			$\sqrt{1}$
c.	12.5			4.0	/ V	W	·V
	12			ase B			
	11.5			°° 2.0			
	11.3+			0.0			
	11		2	)/23	Dec31/18 Jul9/19 Feb25/20	7/20 5/21	5/22
	11	u/zU	5/2	0.7			
	114	Uct//2U Feb25/21	0ct20/21 Mar15/22	May19/23	Deci Ju Feb2	0ct7/20 Feb25/21 0ct20/21	Mar15/22 May19/23
	Dec31//18				0 E		
Laboratory	: WearCheck USA -	501 Madis	son Ave., Ca	ary, NC 27513	0 E	onmental - 031 - Gre	enville/Spartanbu
Laboratory Sample No.	: WearCheck USA - : GFL0096944	501 Madia	son Ave., Ca d : 01	ary, NC 27513 Feb 2024	0 E	onmental - 031 - Gre	enville/Spartanbu
Laboratory Sample No. Lab Number	: WearCheck USA - : GFL0096944 : 06076590	501 Madia Recieved	son Ave., Ca d : 01 ed : 01	ary, NC 27513 Feb 2024 Feb 2024	0 E	onmental - 031 - Gre	enville/Spartanbu ioch Church F Piedmont, S
Laboratory Sample No. Lab Number Unique Number	: WearCheck USA - : GFL0096944 : 06076590 : 10858681	501 Madia	son Ave., Ca d : 01 ed : 01	ary, NC 27513 Feb 2024	GFL Envir	ronmental - 031 - Gre 1635 Anti	enville/Spartanbu ioch Church F Piedmont, S US 2967
Laboratory Sample No. Lab Number Unique Number Test Package	: WearCheck USA - : GFL0096944 : 06076590 : 10858681 : FLEET	501 Madis Recieved Diagnose Diagnose	son Ave., Ca d : 01 ed : 01 tician : We	ary, NC 27513 Feb 2024 Feb 2024 es Davis	GFL Envir	ronmental - 031 - Gre 1635 Anti ntact: TECHNIC	eenville/Spartanbu ioch Church F Piedmont, S US 296 IAN ACCOUN
Laboratory Sample No. Lab Number Unique Number	: WearCheck USA - : GFL0096944 : 06076590 : 10858681 : FLEET contact Customer Serv	501 Madis Recieved Diagnose Diagnost	son Ave., Ca d : 01 ed : 01 tician : We	ary, NC 27513 Feb 2024 Feb 2024 es Davis <i>9.</i>	GFL Envir	ronmental - 031 - Gre 1635 Anti	eenville/Spartanbo ioch Church F Piedmont, S US 296 IAN ACCOUN

NONE

NONE

NONE

NONE