

# **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id **744** Component **Diesel Engine** Fluid **NOT GIVEN (--- GAL)** 

## DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please specify the brand, type, and viscosity of the oil on your next sample.

#### Wear

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

#### Fluid Condition

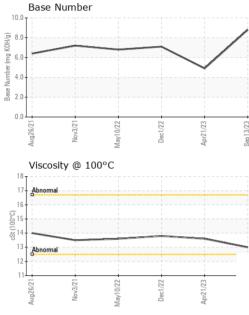
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date   Client Info   13 Sep 2023   21 Apr 2023   16     Machine Age   hrs   Client Info   18347   450052   16     Oil Age   hrs   Client Info   700   20092   63     Oil Changed   Client Info   Changed   Changed   Client Info     Sample Status   Imit/base   current   history1     Fuel   WC Method   >5   <1.0   1     Glycol   WC Method   >5   <1.0   <1   0     WEAR METALS   method   Imit/base   current   history1   1     Iron   ppm   ASTM D5185m   >100   28   33   0     Chromium   ppm   ASTM D5185m   >20   2   2   1     Iritanium   ppm   ASTM D5185m   >3   0   0   14   1     Silver   ppm   ASTM D5185m   >30   3   2   1   1     Aluminum   ppm   ASTM D5185m   >30	history2 FL0060821 Dec 2022 3870 32 anaged DRMAL history2 <1.0 NEG 38 38 3 0
Sample Date   Client Info   13 Sep 2023   21 Apr 2023   16     Machine Age   hrs   Client Info   18347   450052   16     Oil Age   hrs   Client Info   700   20092   63     Oil Changed   Client Info   Changed   Changed   Client Info     Sample Status   Client Info   Changed   Changed   Client Info     Sample Status   MC Method   >5   <1.0   <1.0   Kornyt     Fuel   WC Method   >5   <1.0   <1.0   Kornyt   Kornyt     Fuel   WC Method   >5   <1.0   <1.0   Kornyt   Korny	Dec 2022 870 32 hanged DRMAL history2 <1.0 NEG history2 38 3
Machine Age   hrs   Client Info   18347   450052   160     Oil Age   hrs   Client Info   700   20092   63     Oil Changed   Client Info   Changed   Changed   Client Info     Sample Status   Imit/base   current   history1   Northall   Northall     Fuel   WC Method   >5   <1.0	8870 92 hanged ORMAL history2 <1.0 NEG history2 38 38
Oil AgehrsClient Info7002009266Oil ChangedClient InfoChangedChangedClient InfoSample StatusImageNORMALNORMALNORMALFuelWC Method>5<1.0	32 hanged DRMAL history2 <1.0 NEG history2 38 3
Oil ChangedClient InfoChangedChangedClingedClientSample StatusImathematical and the statusNORMALNORMALNORMALNORMALNormatical and the statusCONTAMINATIONmethodlimit/basecurrenthistory1FuelWC Method>5<1.0<1.0GlycolNEGImathematical and the statusGlycolWC Method>5<1.0<1.0NEGImathematical and the statusImathematical and the statusIronppmASTM D5185m>100283333Imathematical and the statusImathematical and the statusIronppmASTM D5185m>20222Imathematical and the statusImathematical and the statusIronppmASTM D5185m>203314Imathematical and the statusImathematical and the statusSilverppmASTM D5185m>3000Imathematical and the statusImathematical and the statusSilverppmASTM D5185m>4028Imathematical and the statusImathematical and the statusCopperppmASTM D5185m>33032Imathematical and the statusImathematical and the statusCadmiumppmASTM D5185m00Imathematical and the statusImathematical and the statusBoronppmASTM D5185m38511Imathematical and the statusImathematical and the statusBoronppmASTM D5185m<	hanged DRMAL <1.0 \NEG history2 38 3
Sample StatusNORMALNORMALNORMALNORMALNORMALNORMALCONTAMINATIONmethodlimit/basecurrenthistory1FuelWC Method>5<1.0<1.0GlycolWC MethodNEGNEGImit/basenetfortWEAR METALSmethodlimit/basecurrenthistory1IronppmASTM D5185m>1002833ChromiumppmASTM D5185m>2022NickelppmASTM D5185m>400TitaniumppmASTM D5185m>300AluminumppmASTM D5185m>2033LeadppmASTM D5185m>4028CopperppmASTM D5185m>330321InppmASTM D5185m>15<10VanadiumppmASTM D5185m000ADDITIVESmethodlimit/basecurrenthistory11BoronppmASTM D5185m385151BariumppmASTM D5185m46501ManganeseppmASTM D5185m589770745CalciumppmASTM D5185m5897701PosphorusppmASTM D5185m9757451	Anticology Anticology
CONTAMINATIONmethodlimit/basecurrenthistory1FuelWC Method>5<1.0<1.0GlycolWC MethodNEGNEGWEAR METALSmethodlimit/basecurrenthistory1IronppmASTM D5185m>1002833ChromiumppmASTM D5185m>2022NickelppmASTM D5185m>400TitaniumppmASTM D5185m3140SilverppmASTM D5185m300AluminumppmASTM D5185m>300AluminumppmASTM D5185m>300AluminumppmASTM D5185m>3032TinppmASTM D5185m>15<10VanadiumppmASTM D5185m>15<10VanadiumppmASTM D5185m000ADDITIVESmethodlimit/basecurrenthistory1BoronppmASTM D5185m3851BariumppmASTM D5185m4650ManganeseppmASTM D5185m<4650ManganeseppmASTM D5185m<411MagnesiumppmASTM D5185m<4650ManganeseppmASTM D5185m<589770CalciumppmASTM D5185m<975745	history2 <1.0 NEG history2 38 3
Fuel   WC Method   >5   <1.0	<1.0 NEG history2 38 3
GlycolWC MethodNEGNEGGlycolWC MethodNEGNEGWEAR METALSmethodlimit/basecurrenthistory1IronppmASTM D5185m>1002833ChromiumppmASTM D5185m>2022NickelppmASTM D5185m>400TitaniumppmASTM D5185m>300AluminumppmASTM D5185m>300AluminumppmASTM D5185m>2033LeadppmASTM D5185m>4028CopperppmASTM D5185m>33032TinppmASTM D5185m>15<10VanadiumppmASTM D5185m>15<10CadmiumppmASTM D5185m385151BoronppmASTM D5185m385150ManganeseppmASTM D5185m<4650ManganeseppmASTM D5185m589770CalciumppmASTM D5185m589770CalciumppmASTM D5185m975745	NEG history2 38 3
WEAR METALSmethodlimit/basecurrenthistory1IronppmASTM D5185m>1002833ChromiumppmASTM D5185m>2022NickelppmASTM D5185m>400TitaniumppmASTM D5185m>300AluminumppmASTM D5185m>300AluminumppmASTM D5185m>300AluminumppmASTM D5185m>2033LeadppmASTM D5185m>4028CopperppmASTM D5185m>33032TinppmASTM D5185m>15<10VanadiumppmASTM D5185m>15<10PornASTM D5185m>15<1<1<1CadmiumppmASTM D5185m000ADDITIVESmethodIimit/basecurrenthistory1BoronppmASTM D5185m4650ManganeseppmASTM D5185m4650ManganeseppmASTM D5185m<11MagnesiumppmASTM D5185m<589770CalciumppmASTM D5185m19631664PhosphorusppmASTM D5185m975745	history2 38 3
Iron ppm ASTM D5185m >100 28 33   Chromium ppm ASTM D5185m >20 2 2   Nickel ppm ASTM D5185m >4 0 0   Titanium ppm ASTM D5185m >4 0 0   Titanium ppm ASTM D5185m >4 0 0   Silver ppm ASTM D5185m >3 0 0   Aluminum ppm ASTM D5185m >3 0 0   Aluminum ppm ASTM D5185m >20 3 3 3   Lead ppm ASTM D5185m >40 2 8   Copper ppm ASTM D5185m >330 3 2 1   Vanadium ppm ASTM D5185m >15 <1	38 3
Ppm   ASTM D5185m   >20   2   2     Nickel   ppm   ASTM D5185m   >4   0   0     Titanium   ppm   ASTM D5185m   >4   0   0     Titanium   ppm   ASTM D5185m   >3   0   0     ASTM D5185m   >3   0   0   0     ASTM D5185m   >3   0   0   0     Aluminum   ppm   ASTM D5185m   >20   3   3     Lead   ppm   ASTM D5185m   >20   3   2   3     Copper   ppm   ASTM D5185m   >40   2   8   3   2     Tin   ppm   ASTM D5185m   >330   3   2   1   1     Cadmium   ppm   ASTM D5185m   >15   <1   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1	3
Chromium   ppm   ASTM D5185m   >20   2   2     Nickel   ppm   ASTM D5185m   >4   0   0     Titanium   ppm   ASTM D5185m   3   14   14     Silver   ppm   ASTM D5185m   >3   0   0     Aluminum   ppm   ASTM D5185m   >20   3   3   14     Lead   ppm   ASTM D5185m   >20   3   3   2   16     Copper   ppm   ASTM D5185m   >40   2   8   2   16     Tin   ppm   ASTM D5185m   >330   3   2   16     Vanadium   ppm   ASTM D5185m   >15   <1   0   0     Vanadium   ppm   ASTM D5185m   0   0   0   0     Cadmium   ppm   ASTM D5185m   38   51   51     Barium   ppm   ASTM D5185m   38   50   0     Molybdenum   ppm	
Nickel   ppm   ASTM D5185m   >4   0   0     Titanium   ppm   ASTM D5185m   3   14   11   11   11   11   14   <	0
Silver   ppm   ASTM D5185m   >3   0   0     Aluminum   ppm   ASTM D5185m   >20   3   3   1     Lead   ppm   ASTM D5185m   >20   3   3   1     Copper   ppm   ASTM D5185m   >40   2   8     Copper   ppm   ASTM D5185m   >330   3   2   1     Tin   ppm   ASTM D5185m   >15   <1	
Aluminum   ppm   ASTM D5185m   >20   3   3     Lead   ppm   ASTM D5185m   >40   2   8     Copper   ppm   ASTM D5185m   >330   3   2     Tin   ppm   ASTM D5185m   >15   <1   0     Vanadium   ppm   ASTM D5185m   >15   <1   0     Vanadium   ppm   ASTM D5185m   <1   <1   <1     Cadmium   ppm   ASTM D5185m   0   0   0     ADDITIVES   method   limit/base   current   history1     Boron   ppm   ASTM D5185m   38   51     Barium   ppm   ASTM D5185m   0   0     Molybdenum   ppm   ASTM D5185m   46   50     Manganese   ppm   ASTM D5185m   <1   1     Magnesium   ppm   ASTM D5185m   589   770     Calcium   ppm   ASTM D5185m   1963   1664	4
Lead   ppm   ASTM D5185m   >40   2   8     Copper   ppm   ASTM D5185m   >330   3   2   1     Tin   ppm   ASTM D5185m   >15   <1	0
Copper   ppm   ASTM D5185m   >330   3   2     Tin   ppm   ASTM D5185m   >15   <1   0     Vanadium   ppm   ASTM D5185m   >15   <1   0     Vanadium   ppm   ASTM D5185m   <1   <1   <1     Cadmium   ppm   ASTM D5185m   0   0   0     ADDITIVES   method   limit/base   current   history1     Boron   ppm   ASTM D5185m   38   51     Barium   ppm   ASTM D5185m   0   0     Molybdenum   ppm   ASTM D5185m   46   50     Manganese   ppm   ASTM D5185m   <1   1     Magnesium   ppm   ASTM D5185m   589   770     Calcium   ppm   ASTM D5185m   1963   1664     Phosphorus   ppm   ASTM D5185m   975   745	4
Tin   ppm   ASTM D5185m   >15   <1	18
Vanadium   ppm   ASTM D5185m   <1	2
Cadmium   ppm   ASTM D5185m   0   0     ADDITIVES   method   limit/base   current   history1     Boron   ppm   ASTM D5185m   38   51     Barium   ppm   ASTM D5185m   0   0     Molybdenum   ppm   ASTM D5185m   46   50     Manganese   ppm   ASTM D5185m   <1   1     Magnesium   ppm   ASTM D5185m   589   770     Calcium   ppm   ASTM D5185m   1664   9     Phosphorus   ppm   ASTM D5185m   745   164	0
ADDITIVES   method   limit/base   current   history1     Boron   ppm   ASTM D5185m   38   51     Barium   ppm   ASTM D5185m   0   0     Molybdenum   ppm   ASTM D5185m   46   50     Manganese   ppm   ASTM D5185m   <1   1     Magnesium   ppm   ASTM D5185m   <389   770     Calcium   ppm   ASTM D5185m   1963   1664     Phosphorus   ppm   ASTM D5185m   975   745	<1
Boron   ppm   ASTM D5185m   38   51     Barium   ppm   ASTM D5185m   0   0     Molybdenum   ppm   ASTM D5185m   46   50     Manganese   ppm   ASTM D5185m   <1   1     Magnesium   ppm   ASTM D5185m   <1   1     Calcium   ppm   ASTM D5185m   589   770     Phosphorus   ppm   ASTM D5185m   1963   1664	0
Barium   ppm   ASTM D5185m   0   0     Molybdenum   ppm   ASTM D5185m   46   50     Manganese   ppm   ASTM D5185m   <1   1     Magnesium   ppm   ASTM D5185m   <1   1     Calcium   ppm   ASTM D5185m   589   770     Calcium   ppm   ASTM D5185m   1963   1664     Phosphorus   ppm   ASTM D5185m   975   745	history2
Molybdenum   ppm   ASTM D5185m   46   50     Manganese   ppm   ASTM D5185m   <1	102
Manganese   ppm   ASTM D5185m   <1	0
Magnesium   ppm   ASTM D5185m   589   770     Calcium   ppm   ASTM D5185m   1963   1664     Phosphorus   ppm   ASTM D5185m   975   745	93
Calcium   ppm   ASTM D5185m   1963   1664     Phosphorus   ppm   ASTM D5185m   975   745	<1
Phosphorus   ppm   ASTM D5185m   975   745	582
	1780
	788
Zinc ppm ASTM D5185m <b>1205</b> 898	968
Sulfur   ppm   ASTM D5185m   3829   3674	3484
CONTAMINANTS method limit/base current history1	history2
Silicon ppm ASTM D5185m >25 14 6	6
Sodium   ppm   ASTM D5185m   10   11	5
Potassium   ppm   ASTM D5185m   >20   2   3	<1
INFRA-RED method limit/base current history1	history2
Soot % *ASTM D7844 >3 0.3 0.6	
Nitration Abs/cm *ASTM D7624 >20 9.1 11.4	0.6
Sulfation   Abs/.1mm   *ASTM D7415   >30   22.4   23.5	
FLUID DEGRADATION method limit/base current history1	0.6
Oxidation Abs/.1mm *ASTM D7414 >25 19.7 20.6	0.6
Base Number (BN)   mg KOH/g   ASTM D2896   8.8   4.9	0.6 12.1 26.1



# **OIL ANALYSIS REPORT**

VISUAL



	Laboratory Sample No.	Laboratory : WearCheck USA - Sample No. : GFL0084501 Lab Number : 05953729 Unique Number : 10649688 Test Package : FLEET sample report, contact Customer Ser			: 18 Se	y, NC 27513 ep 2023 ep 2023	B GF	GFL Environmental - 629 - Northern A 3947 US 131 Kalkaska, M US 49646-842 Contact: MITCH HERSHBERGE			
		12- 11-	May10/22	Dec1/22 +	Apr21/23	2.0 1.0 0.0 8	•	May10/22	Dec1/22	Apr21/23	
		() 15 ts 14				(B/HO) 6.0 (B/HO) 6.0 (B/HO) 80 (B/HO) 80 (B/H	)			$\checkmark$	
		17- Abnormal				9.0 8.0 207.0	•				/
		A	May10/22 @	Dec	Apr2		Base Nur	nber			
		5001100	ay10/22	Dec1/22	Apr21/23	Sep13/23					
		10-									
		25 - 20 - 20 - 20 - 20 - 20 - 20 - 20 -									
		Non-ferr <sup>30</sup> T	ous Metals								
		Aug26/21	May10/22	Dec1/22	Apr21/23	Sep13/23					
		15									
Dec1/22	Apr21/23	30 25 E 20	romium ckel			<b>`</b>					
22	23	Ferrous A	n	$\wedge$							
		Visc @ 10 GRAPH		St AST	M D445		13.0	13	.6	13.8	
			PROPERT		ethod	limit/base	currei		istory1	histo	ory2
		Emulsified Free Wate		calar *Vis calar *Vis		>0.2	NEG NEG	NE		NEG NEG	
Dec1/22	Apr21/23 Sep13/23		S	calar *Vis	ual 1	NORML	NORM	. NC	DRML	NORN	
Dec1/22 + -	3/23	_ Sand/Dirt Appearance		calar *Vis calar *Vis		NONE	NONE NORML		DNE DRML	NONE	
		Debris	S	calar *Vis	ual 1	NONE	NONE	NC	DNE	NONE	-
	$\sim$	Precipitate Silt		calar *Vis calar *Vis		NONE	NONE NONE		DNE DNE	NONE	
		Duestalistete		*)/:-			NONE	NIC		NONE	-

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Submitted By: Mitch Hershberger