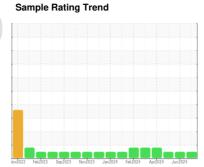


# **OIL ANALYSIS REPORT**



Area (34745UA) 913006 Diesel Engine

DIESEL ENGINE OIL SAE 40 (--- GAL)





## DIAGNOSIS

### Recommendation

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

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

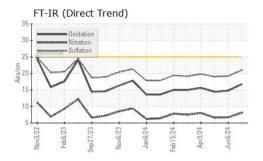
### Fluid Condition

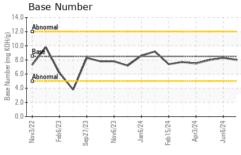
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

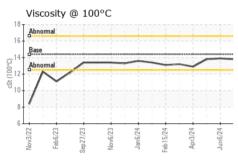
SAMPLE INFORMATION   method   limit/base   current   history1   GFL0112094   GFL0	AE 40 ( GAL)		lov2022 Febi	2023 Sep 2023 Nov 2023	Jan 2024 Feb 2024 Apr 2024	Jun2024	
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         4799         4666         4511           Oil Age         hrs         Client Info         Not Changd         Not Changd         Not Changd           Oil Changed Sample Status         Client Info         Not Changd         Not Changd         NORMAL         NORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0           Water         WC Method         NEG         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG         NEG           WEAR METALS         method         limil/base         current         history2         history2           Iron         ppm         ASTM D5185m         >12.0         7         5         5         5           WEAR METALS         method         limil/base         current         history2         history2           Iron         ppm         ASTM D5185m         >12.0         7         5         5         2         1         1         0         0         1         1         0	Sample Number		Client Info		GFL0121994	GFL0122041	GFL0116615
Oil Age         hrs         Client Info         4644         155         4511           Oil Changed Sample Status         Client Info         Not Changed NORMAL         NORM	Sample Date		Client Info		25 Jun 2024	06 Jun 2024	15 May 2024
Cilient Info   Not Change   Not Change   Normal   Norma	Machine Age	hrs	Client Info		4799	4666	4511
CONTAMINATION	Oil Age	hrs	Client Info		4644	155	4511
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0         <1.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imition         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >120         7         5         5           Nickel         ppm         ASTM D5185m         >20         <1         <1         0           Nickel         ppm         ASTM D5185m         >2         <1         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         <1           Lead         ppm         ASTM D5185m         >40         <1         0         0           Copper         ppm         ASTM D5185m         >330         1         1         1         2           Tin         ppm         ASTM D5185m         >15         <1         <1 <t< th=""><th>Oil Changed</th><th></th><th>Client Info</th><th></th><th>Not Changd</th><th>Not Changd</th><th>Changed</th></t<>	Oil Changed		Client Info		Not Changd	Not Changd	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         Imit/base         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >12.0         7         5         5           Chromium         ppm         ASTM D5185m         >2.0         <1         <1         0           Nickel         ppm         ASTM D5185m         >5         2         2         2         1           Silver         ppm         ASTM D5185m         >2         0         0         <1           Aluminum         ppm         ASTM D5185m         >20         4         2         1           Lead         ppm         ASTM D5185m         >40         <1         0         0           Copper         ppm         ASTM D5185m         >15         <1         <1         0           Tin         ppm         ASTM D5185m         >15         <1         <1         0           Cadmium         ppm         ASTM D5185m         >10         0         0	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Iron	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1         <1         0           Nickel         ppm         ASTM D5185m         >5         2         2         1           Titanium         ppm         ASTM D5185m         >2         <1         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         <1           Aluminum         ppm         ASTM D5185m         >2         0         0         <1           Aluminum         ppm         ASTM D5185m         >2         0         0         <1           Lead         ppm         ASTM D5185m         >2         0         0         0           Copper         ppm         ASTM D5185m         >40         <1         0         0           Vanadium         ppm         ASTM D5185m         >15         <1         <1         0         <1           Cadmium         ppm         ASTM D5185m         >15         <1         <1         0         <1         <1         0         <1         <1         0         <1         <1         <0         <1         <1         <1         <0         <1         <1 <t< td=""><td>WEAR METAL</td><td>S</td><td>method</td><td>limit/base</td><th>current</th><td>history1</td><td>history2</td></t<>	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >5         2         2         1           Titanium         ppm         ASTM D5185m         >2         <1	Iron	ppm	ASTM D5185m	>120	7	5	5
Titanium         ppm         ASTM D5185m         >2         <1         <1         0           Silver         ppm         ASTM D5185m         >2         0         0         <1           Aluminum         ppm         ASTM D5185m         >20         4         2         1           Lead         ppm         ASTM D5185m         >40         <1         0         0           Copper         ppm         ASTM D5185m         >330         1         1         2           Tin         ppm         ASTM D5185m         >15         <1         <1         0           Vanadium         ppm         ASTM D5185m         >15         <1         0         <1           Cadmium         ppm         ASTM D5185m         <1         0         0         <0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         13         21         20           ADDITIVES         method         limit/base         current         history1         history2           Barium         ppm         ASTM D5185m         10         0         0	Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Stiver	Nickel	ppm	ASTM D5185m	>5	2	2	1
Aluminum	Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Lead	Silver	ppm	ASTM D5185m	>2	0	0	<1
Copper         ppm         ASTM D5185m         >330         1         1         2           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	4	2	1
Tin	Lead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium         ppm         ASTM D5185m         <1         0         <1           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         13         21         20           Barium         ppm         ASTM D5185m         10         0         0         0           Molybdenum         ppm         ASTM D5185m         100         54         58         61           Manganese         ppm         ASTM D5185m         100         54         58         61           Magnesium         ppm         ASTM D5185m         450         905         907         885           Calcium         ppm         ASTM D5185m         450         905         907         885           Calcium         ppm         ASTM D5185m         1150         1021         924         970           Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         >25         5         4	Copper	ppm	ASTM D5185m	>330	1	1	2
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         13         21         20           Barium         ppm         ASTM D5185m         10         0         0         0           Molybdenum         ppm         ASTM D5185m         100         54         58         61           Manganese         ppm         ASTM D5185m         100         54         58         61           Magnesium         ppm         ASTM D5185m         450         905         907         885           Calcium         ppm         ASTM D5185m         3000         1115         1138         1121           Phosphorus         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >216	Tin	ppm	ASTM D5185m	>15	<1	<1	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	0	<1
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         10         0         0         0           Molybdenum         ppm         ASTM D5185m         100         54         58         61           Manganese         ppm         ASTM D5185m         <1         <1         0           Magnesium         ppm         ASTM D5185m         450         905         907         885           Calcium         ppm         ASTM D5185m         3000         1115         1138         1121           Phosphorus         ppm         ASTM D5185m         1150         1021         924         970           Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         3         2         2           Potassium         ppm         ASTM D5185m         >20 </th <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         100         54         58         61           Manganese         ppm         ASTM D5185m         <1         <1         0           Magnesium         ppm         ASTM D5185m         450         905         907         885           Calcium         ppm         ASTM D5185m         3000         1115         1138         1121           Phosphorus         ppm         ASTM D5185m         1150         1021         924         970           Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >20         3         2         2           Potassium         ppm         ASTM D5185m         >20         3         2         2           INFRA-RED         method         limit/base <th< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td>250</td><th></th><td></td><td></td></th<>	Boron	ppm	ASTM D5185m	250			
Manganese         ppm         ASTM D5185m         <1         <1         0           Magnesium         ppm         ASTM D5185m         450         905         907         885           Calcium         ppm         ASTM D5185m         3000         1115         1138         1121           Phosphorus         ppm         ASTM D5185m         1150         1021         924         970           Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1		ppm					
Magnesium         ppm         ASTM D5185m         450         905         907         885           Calcium         ppm         ASTM D5185m         3000         1115         1138         1121           Phosphorus         ppm         ASTM D5185m         1150         1021         924         970           Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1         2           Potassium         ppm         ASTM D5185m         >20         3         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >4         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7415         >30	•	ppm		100			
Calcium         ppm         ASTM D5185m         3000         1115         1138         1121           Phosphorus         ppm         ASTM D5185m         1150         1021         924         970           Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1	-	ppm	ASTM D5185m				
Phosphorus         ppm         ASTM D5185m         1150         1021         924         970           Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1	-	ppm					
Zinc         ppm         ASTM D5185m         1350         1248         1191         1224           Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1		ppm			-		
Sulfur         ppm         ASTM D5185m         4250         3278         3132         3535           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1							
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1							
Silicon         ppm         ASTM D5185m         >25         5         4         4           Sodium         ppm         ASTM D5185m         >216         5         <1         2           Potassium         ppm         ASTM D5185m         >20         3         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.1         6.7         6.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.0         19.2         19.0           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.8         14.8         14.4			ASTM D5185m	4250	3278	3132	3535
Sodium         ppm         ASTM D5185m         >216         5         <1         2           Potassium         ppm         ASTM D5185m         >20         3         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.1         6.7         6.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.0         19.2         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.8         14.8         14.4		ITS	method		current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         2         2           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.1         6.7         6.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.0         19.2         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.8         14.8         14.4							
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.1         6.7         6.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.0         19.2         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.8         14.8         14.4							
Soot %         %         *ASTM D7844 >4         0.4         0.2         0.2           Nitration         Abs/cm         *ASTM D7624 >20         8.1         6.7         6.6           Sulfation         Abs/.1mm         *ASTM D7415 >30         21.0         19.2         19.0           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         16.8         14.8         14.4		ppm	ASTM D5185m	>20	3	2	2
Nitration         Abs/cm         *ASTM D7624         >20         8.1         6.7         6.6           Sulfation         Abs/.1mm         *ASTM D7415         >30         21.0         19.2         19.0           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.8         14.8         14.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         21.0         19.2         19.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.8         14.8         14.4							
FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     16.8     14.8     14.4		Abs/cm	*ASTM D7624	>20			6.6
Oxidation Abs/.1mm *ASTM D7414 >25 <b>16.8</b> 14.8 14.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.0	19.2	19.0
	FLUID DEGRA	NOITAC	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         8.5         8.0         8.3         8.0	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.8	14.8	14.4
	Base Number (BN)	mg KOH/g	ASTM D2896	8.5	8.0	8.3	8.0



# **OIL ANALYSIS REPORT**



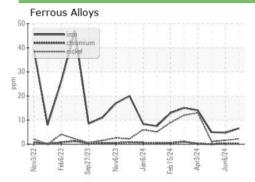




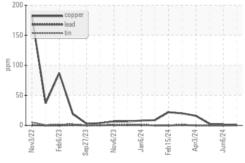
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

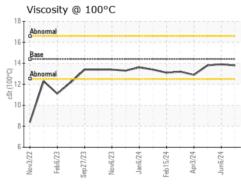
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.8	13.9	13.8

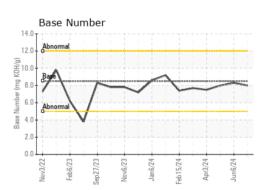
## **GRAPHS**















Certificate 12367

Laboratory Sample No.

Test Package : FLEET

: GFL0121994 Lab Number : 06222176 Unique Number : 11100373

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 27 Jun 2024 **Tested** : 28 Jun 2024 Diagnosed : 28 Jun 2024 - Wes Davis

GFL Environmental - 652 - Fredericksburg Hauling 10954 Houser Drive

Fredericksburg, VA US 22408

Contact: WILLIAM MILO wmilo@gflenv.com T:

To discuss this sample report, contact Customer Service at 1-800-237-1369. \* - 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)

Report Id: GFL652 [WUSCAR] 06222176 (Generated: 06/29/2024 10:52:01) Rev: 1

Submitted By: TECHNICIAN ACCOUNT

F: