

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id **227054-632103**

Component **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.

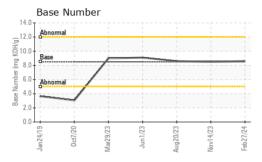
Fluid Condition

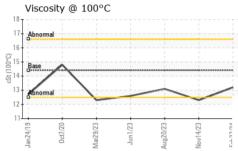
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Client Info	AE 40 (GAL)		Jan 2019	Oct2020 Mar2023	Jun2023 Aug2023 Nov2023	Feb2024	
Client Info	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 10754 10718 10611 Oil Age hrs Client Info 0 33417 0 Oil Changed Client Info N/A Changed N/A Sample Status NORMAL NORMAL NORMAL CONTAMINATION method Imitibase current history1 history2 Fuel WC Method >5 <1.0 1.5 <1.0 Water WC Method >0.2 NEG NEG NEG WEAR METALS method Imitibase current history1 history2 Iron ppm ASTM 05185m >80 2 7 3 Iron ppm ASTM 05185m >5 0 <1 0 Vicalina ppm ASTM 05185m >2 0 <1 <1 <1 Silver ppm ASTM 05185m >30 0 <1 <1 <1 <1 <1 <1 <1	Sample Number		Client Info		GFL0102972	GFL0090954	GFL0074783
Oil Age hrs Client Info N/A Changed N/A Oil Changed Client Info N/A Changed N/A Sample Status Client Info N/A Changed N/A Sample Status Client Info N/A Changed N/A Sample Status WC Method Securing Listory2 Fuel WC Method Securing NEG NEG Water WC Method NEG NEG NEG WEG NEG NEG NEG NEG WEAR METALS method limil/base current history1 history2 Iron ppm ASTM D5185m >80 2 7 3 Obromium ppm ASTM D5185m >80 2 7 3 Obromium ppm ASTM D5185m >30 0 <1 0 Nickel ppm ASTM D5185m >30 0 <1 0 Siliver ppm	Sample Date		Client Info		27 Feb 2024	14 Nov 2023	20 Aug 2023
Cilichanged Cilicht Info N/A NORMAL NORMAL NORMAL	Machine Age	hrs	Client Info		10754	10718	10611
NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 history2	Oil Age	hrs	Client Info		0	33417	0
Fuel	Oil Changed		Client Info		N/A	Changed	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >80 2 7 3 Chromium ppm ASTM D5185m >5 0 <1 0 Nickel ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >2 0 <1 <1 Silver ppm ASTM D5185m >30 0 <1 <1 Silver ppm ASTM D5185m >30 0 <1 <1 <1 Silver ppm ASTM D5185m >30 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >80 2 7 3 Chromium ppm ASTM D5185m >5 0 <1	Fuel		WC Method	>5	<1.0	1.5	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 0 <1 0 Nickel ppm ASTM D5185m >2 0 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>80	2	7	3
Titanium	Chromium	ppm	ASTM D5185m	>5	0	<1	0
Silver	Nickel	ppm	ASTM D5185m	>2	0	<1	0
Aluminum	Titanium	ppm	ASTM D5185m		0	<1	<1
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >150 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Aluminum	ppm	ASTM D5185m	>30	1	2	<1
Trin	Lead	ppm	ASTM D5185m	>30	0	<1	0
Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 8 9 10 Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 63 65 64 Manganese ppm ASTM D5185m 100 63 65 64 Manganesium ppm ASTM D5185m 450 992 833 877 Calcium ppm ASTM D5185m 450 992 833 877 Calcium ppm ASTM D5185m 1150 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m >20 3481 3432	Copper	ppm	ASTM D5185m	>150	<1	<1	<1
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 8 9 10 Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 63 65 64 Manganese ppm ASTM D5185m 100 63 65 64 Manganesium ppm ASTM D5185m 450 992 833 877 Calcium ppm ASTM D5185m 3000 1120 1108 1164 Phosphorus ppm ASTM D5185m 3000 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 20 3481 3432 3558 CONTAMINANTS method limit/base current	Tin	ppm	ASTM D5185m	>5	0	0	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 63 65 64 Manganese ppm ASTM D5185m 100 63 65 64 Manganese ppm ASTM D5185m 100 992 833 877 Calcium ppm ASTM D5185m 3000 1120 1108 1164 Phosphorus ppm ASTM D5185m 3000 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >20 <1 2 <1 Interpretable of the properties of the propert	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 100 63 65 64 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 450 992 833 877 Calcium ppm ASTM D5185m 3000 1120 1108 1164 Phosphorus ppm ASTM D5185m 1150 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >20 <1 2 <1 INFRA-RED method limit/base current <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>250</td> <th></th> <td></td> <td></td>	Boron	ppm	ASTM D5185m	250			
Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 450 992 833 877 Calcium ppm ASTM D5185m 3000 1120 1108 1164 Phosphorus ppm ASTM D5185m 1150 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th></th> <td></td> <td>0</td>	Barium	ppm	ASTM D5185m				0
Magnesium ppm ASTM D5185m 450 992 833 877 Calcium ppm ASTM D5185m 3000 1120 1108 1164 Phosphorus ppm ASTM D5185m 1150 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >20 <1	-	ppm		100			
Calcium ppm ASTM D5185m 3000 1120 1108 1164 Phosphorus ppm ASTM D5185m 1150 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1	-	ppm					
Phosphorus ppm ASTM D5185m 1150 1195 899 978 Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1	Magnesium	ppm	ASTM D5185m				
Zinc ppm ASTM D5185m 1350 1351 1179 1191 Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1		ppm					
Sulfur ppm ASTM D5185m 4250 3481 3432 3558 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1							
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1							
Silicon ppm ASTM D5185m >20 3 3 2 Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 7.9 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 19.7 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9			ASTM D5185m	4250	3481	3432	3558
Sodium ppm ASTM D5185m >216 2 0 1 Potassium ppm ASTM D5185m >20 <1 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 7.9 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 19.7 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9		ITS	method		current		
Potassium ppm ASTM D5185m >20 <1 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 7.9 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 19.7 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9							
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 7.9 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 19.7 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9		ppm	ASTM D5185m	>216	2		
Soot % % *ASTM D7844 >3 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 5.7 7.9 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 19.7 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9		ppm	ASTM D5185m	>20	<1	2	<1
Nitration Abs/cm *ASTM D7624 >20 5.7 7.9 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 17.9 19.7 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9	INFRA-RED			limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 17.9 19.7 17.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9							
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm 'ASTM D7414 >25 14.0 16.4 13.9	Nitration						
Oxidation Abs/.1mm *ASTM D7414 >25 14.0 16.4 13.9	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.9	19.7	17.6
	FLUID DEGRA	ATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 8.5 8.6 8.5 8.6	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.0	16.4	13.9
	Base Number (BN)	mg KOH/g	ASTM D2896	8.5	8.6	8.5	8.6



OIL ANALYSIS REPORT

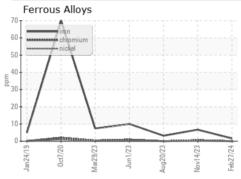


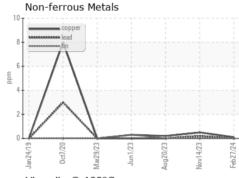


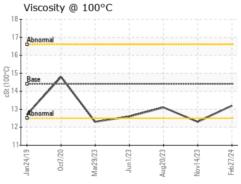
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

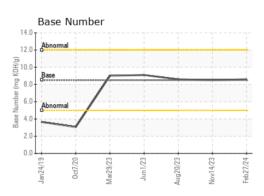
FLUID PROPE	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.2	12.3	13.1

GRAPHS













Certificate L2367

Laboratory Sample No.

Lab Number : 06103574 Unique Number : 10901804 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0102972 Received : 28 Feb 2024 **Tested**

: 01 Mar 2024 Diagnosed : 01 Mar 2024 - Wes Davis

GFL Environmental - 816 - WCA of South Arkansas 3083 Smackover Hwy

El Dorado, AR US 71730

Contact: Mike Howell mike.howell@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)

F: