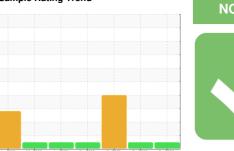


OIL ANALYSIS REPORT

Sample Rating Trend









Machine Id
413032
Component
Diesel Engine
Fluid

DIESEL ENGINE OIL SAE 15W30 (11 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.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

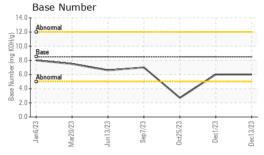
Fluid Condition

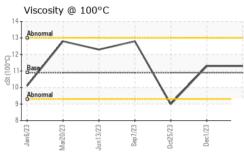
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION method limit/base current history1 history2	AE 15W30 (11 G	AL)	Jan 2023	Mar2023 Jun2023	Sep2023 Oct2023 Dec2023	Dec2023	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 2746 2667 2408 Oil Age hrs Client Info 348 0 227 Oil Changed Client Info Changed Not Changed Changed Not Changed Changed NorMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	Sample Number		Client Info		GFL0074624	GFL0074628	GFL0092451
Oil Age hrs Client Info 348 0 227 Oil Changed Client Info Changed Not Changed Changed Changed Not Changed Changed ABNORMAL ABNORMAL <t< td=""><td>Sample Date</td><td></td><td>Client Info</td><td></td><th>13 Dec 2023</th><td>01 Dec 2023</td><td>25 Oct 2023</td></t<>	Sample Date		Client Info		13 Dec 2023	01 Dec 2023	25 Oct 2023
Coli Changed Changed Normal Normal	Machine Age	hrs	Client Info		2746	2667	2408
CONTAMINATION method militibase current history1 history2	Oil Age	hrs	Client Info		348	0	227
Fuel	Oil Changed		Client Info		Changed	Not Changd	Changed
Fuel	Sample Status				NORMAL	NORMAL	ABNORMAL
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 >120 8 5 6 Chromium ppm ASTM D5185m >20 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	0.2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>120	8	5	6
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>5	1	0	<1
Aluminum ppm ASTM D5185m >20 5 3 7 Lead ppm ASTM D5185m >40 <1 0 0 Copper ppm ASTM D5185m >330 1 <1 2 Tin ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m	Titanium	ppm	ASTM D5185m	>2	<1	0	<1
Lead ppm ASTM D5185m >40 <1 0 0 Copper ppm ASTM D5185m >330 1 <1 2 Tin ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m >15 <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 2 3 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 2 3 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 2 3 0 0 Molybdenum ppm ASTM D5185m 10	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper	Aluminum	ppm	ASTM D5185m	>20	5	3	7
Trin	_ead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 2 3 △ 0 Barium ppm ASTM D5185m 10 12 2 0 Molybdenum ppm ASTM D5185m 100 54 51 △ 23 Manganese ppm ASTM D5185m 100 54 51 △ 23 Magnesium ppm ASTM D5185m 450 692 639 301 23 Calcium ppm ASTM D5185m 3000 836 800 △ 359 Phosphorus ppm ASTM D5185m 1350 968 913 △ 581 Sulfur ppm ASTM D5185m >25 4 3 4 CONTAMINANTS	Copper	ppm	ASTM D5185m	>330	1	<1	2
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 2 3 △ 0 Barium ppm ASTM D5185m 10 12 2 0 Molybdenum ppm ASTM D5185m 100 54 51 △ 23 Manganese ppm ASTM D5185m 450 692 639 301 Calcium ppm ASTM D5185m 3000 836 800 △ 359 Phosphorus ppm ASTM D5185m 1150 823 761 △ 467 Zinc ppm ASTM D5185m 1350 968 913 △ 581 Sulfur ppm ASTM D5185m 220 2471 2288 △ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20	Tin	ppm	ASTM D5185m	>15	<1	0	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 2 3 △ 0 Barium ppm ASTM D5185m 10 12 2 0 Molybdenum ppm ASTM D5185m 100 54 51 △ 23 Manganese ppm ASTM D5185m <1 0 <1 Magnesium ppm ASTM D5185m 450 692 639 301 Calcium ppm ASTM D5185m 3000 836 800 △ 359 Phosphorus ppm ASTM D5185m 1150 823 761 △ 467 Zinc ppm ASTM D5185m 1350 968 913 △ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 △ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Potassium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/m *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/m *ASTM D7414 >25 11.7 11.3 7.6	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 10 12 2 0 Molybdenum ppm ASTM D5185m 100 54 51 ▲ 23 Manganese ppm ASTM D5185m 100 <1 0 <1 Magnesium ppm ASTM D5185m 450 692 639 301 Calcium ppm ASTM D5185m 3000 836 800 ▲ 359 Phosphorus ppm ASTM D5185m 1150 823 761 ▲ 467 Zinc ppm ASTM D5185m 1350 968 913 ▲ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 ▲ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 12 9 15 INFRA-RED method lim	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 100 54 51 ▲ 23 Manganese ppm ASTM D5185m < 1 0 <1 Magnesium ppm ASTM D5185m 450 692 639 301 Calcium ppm ASTM D5185m 3000 836 800 ▲ 359 Phosphorus ppm ASTM D5185m 1150 823 761 ▲ 467 Zinc ppm ASTM D5185m 1350 968 913 ▲ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 ▲ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >4 0.3	Boron	ppm	ASTM D5185m	250	2	3	<u> </u>
Manganese ppm ASTM D5185m <1 0 <1 Magnesium ppm ASTM D5185m 450 692 639 301 Calcium ppm ASTM D5185m 3000 836 800 △ 359 Phosphorus ppm ASTM D5185m 1150 823 761 △ 467 Zinc ppm ASTM D5185m 1350 968 913 △ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 △ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20	Barium	ppm	ASTM D5185m	10	12	2	0
Magnesium ppm ASTM D5185m 450 692 639 301 Calcium ppm ASTM D5185m 3000 836 800 △ 359 Phosphorus ppm ASTM D5185m 1150 823 761 △ 467 Zinc ppm ASTM D5185m 1350 968 913 △ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 △ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm	Molybdenum	ppm	ASTM D5185m	100	54	51	<u>23</u>
Calcium ppm ASTM D5185m 3000 836 800 △ 359 Phosphorus ppm ASTM D5185m 1150 823 761 △ 467 Zinc ppm ASTM D5185m 1350 968 913 △ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 △ 1098 CONTAMINANTS method limit/base current history1 history2 Soliicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUI	Manganese	ppm	ASTM D5185m		<1	0	<1
Phosphorus ppm ASTM D5185m 1150 823 761 ▲ 467 Zinc ppm ASTM D5185m 1350 968 913 ▲ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 ▲ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation	Magnesium	ppm	ASTM D5185m	450	692	639	301
Zinc ppm ASTM D5185m 1350 968 913 △ 581 Sulfur ppm ASTM D5185m 4250 2471 2288 △ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 0 0 4 Potassium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Calcium	ppm	ASTM D5185m	3000	836	800	△ 359
Sulfur ppm ASTM D5185m 4250 2471 2288 ▲ 1098 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 0 0 4 Potassium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Phosphorus	ppm	ASTM D5185m	1150	823	761	△ 467
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 0 0 4 Potassium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Zinc	ppm	ASTM D5185m	1350	968	913	<u></u> ▲ 581
Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 0 0 4 Potassium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Sulfur	ppm	ASTM D5185m	4250	2471	2288	▲ 1098
Sodium ppm ASTM D5185m 0 0 4 Potassium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 12 9 15 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Silicon	ppm	ASTM D5185m	>25	4	3	4
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Sodium	ppm	ASTM D5185m		0	0	4
Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Potassium	ppm	ASTM D5185m	>20	12	9	15
Nitration Abs/cm *ASTM D7624 >20 6.2 5.6 4.6 Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Soot %	%	*ASTM D7844	>4	0.3	0.2	0.3
Sulfation Abs/.1mm *ASTM D7415 >30 16.8 16.4 14.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.7 11.3 7.6	Nitration	Abs/cm	*ASTM D7624	>20		5.6	4.6
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30			
	FLUID DEGRA	AOITAC	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	11.7	11.3	7.6
	Base Number (BN)	mg KOH/g			6.0	6.0	



OIL ANALYSIS REPORT

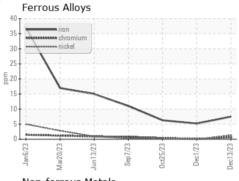


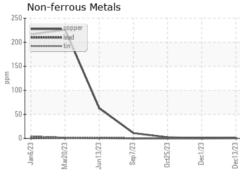


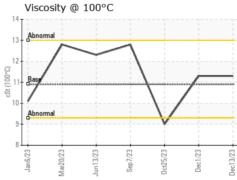
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

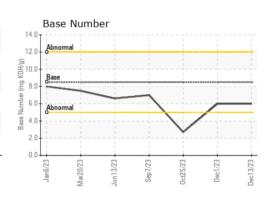
FLUID PROPE	RHES	metnoa	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	10.9	11.3	11.3	4 9

GRAPHS













Certificate L2367

Laboratory Sample No. Lab Number Unique Number : 10791774 Test Package : FLEET

: GFL0074624 : 06036545

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 15 Dec 2023 Diagnosed : 19 Dec 2023

Diagnostician : Sean Felton

GFL Environmental - 095 - Atlanta West 2699 Cochran Industrial Blvd Douglasville, GA US 30127-1332 Contact: Darrell Welch darrell.welch@gflenv.com T: (800)207-6618

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)