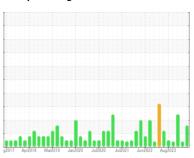


OIL ANALYSIS REPORT

Sample Rating Trend





3743 Component **Diesel Engine**

DIESEL ENGINE OIL SAE 15W40 (11 GAL)

DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition. Please specify the brand, type, and viscosity of the oil on your next sample.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

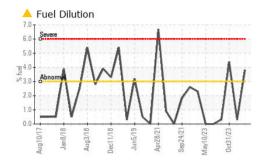
Fluid Condition

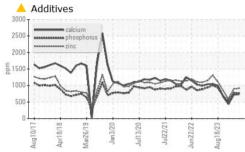
Calcium ppm levels are abnormally low. Visc @ 100°C is abnormally low. The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

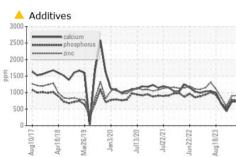
				Julz020 Julz021 Junz022 A		
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL06096096	GFL0074638	GFL0092482
Sample Date		Client Info		20 Feb 2024	13 Nov 2023	31 Oct 2023
Machine Age	hrs	Client Info		20454	19937	19878
Oil Age	hrs	Client Info		0	59	0
Oil Changed		Client Info		Changed	Not Changd	N/A
Sample Status				ABNORMAL	ATTENTION	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	52	10	60
Chromium	ppm	ASTM D5185m	>5	2	<1	3
Nickel	ppm	ASTM D5185m	>4	<1	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	3	1	2
Lead	ppm	ASTM D5185m	>25	0	0	<1
Copper	ppm	ASTM D5185m	>100	2	<1	2
Tin	ppm	ASTM D5185m	>4	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVEO			11 11 /1		111	la la taura O
ADDITIVES		method	limit/base	current	history1	nistory2
ADDITIVES Boron	ppm				history1	history2 <1
Boron	ppm	ASTM D5185m	250	4	6	<1
Boron Barium	ppm	ASTM D5185m ASTM D5185m	250 10	4 0	6	<1 5
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250	4 0 49	6 0 46	<1 5 26
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	4 0 49 <1	6 0 46 <1	<1 5 26 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	4 0 49 <1 660	6 0 46 <1 646	<1 5 26 <1 351
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	4 0 49 <1 660 ▲ 735	6 0 46 <1 646 720	<1 5 26 <1 351 437
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	4 0 49 <1 660 ▲ 735 761	6 0 46 <1 646 720 774	<1 5 26 <1 351 437 531
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	4 0 49 <1 660 ▲ 735	6 0 46 <1 646 720	<1 5 26 <1 351 437
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	4 0 49 <1 660 ▲ 735 761 911	6 0 46 <1 646 720 774 896 2252	<1 5 26 <1 351 437 531 583 1405
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base	4 0 49 <1 660 ▲ 735 761 911 2127	6 0 46 <1 646 720 774 896 2252 history1	<1 5 26 <1 351 437 531 583 1405 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25	4 0 49 <1 660 ▲ 735 761 911 2127 current 8	6 0 46 <1 646 720 774 896 2252 history1	<1 5 26 <1 351 437 531 583 1405 history2 20
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11	6 0 46 <1 646 720 774 896 2252 history1 3	<1 5 26 <1 351 437 531 583 1405 history2 20 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25	4 0 49 <1 660 ▲ 735 761 911 2127 current 8	6 0 46 <1 646 720 774 896 2252 history1	<1 5 26 <1 351 437 531 583 1405 history2 20
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11	6 0 46 <1 646 720 774 896 2252 history1 3 3	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 >3.0 limit/base	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11 2 ▲ 3.8	6 0 46 <1 646 720 774 896 2252 history1 3 3 1 0.3	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2 ▲ 4.4 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm	ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 >3.0 limit/base >6	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11 2 ▲ 3.8 current	6 0 46 <1 646 720 774 896 2252 history1 3 3 1 0.3 history1 1.4	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2 ▲ 4.4 history2 4.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm	ASTM D5185m ASTM D7844 *ASTM D7844	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 >3.0 limit/base >6 >20	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11 2 ▲ 3.8 current 1.5 9.6	6 0 46 <1 646 720 774 896 2252 history1 3 3 1 0.3 history1 1.4 5.2	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2 ▲ 4.4 history2 4.7 9.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 >3.0 limit/base >6 >20 >30	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11 2 ▲ 3.8 current 1.5 9.6 19.9	6 0 46 <1 646 720 774 896 2252 history1 3 1 0.3 history1 1.4 5.2 17.8	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2 ▲ 4.4 history2 4.7 9.4 23.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 >3.0 limit/base >6 >20	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11 2 ▲ 3.8 current 1.5 9.6	6 0 46 <1 646 720 774 896 2252 history1 3 3 1 0.3 history1 1.4 5.2	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2 ▲ 4.4 history2 4.7 9.4 23.8 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE Oxidation	ppm	ASTM D5185m ASTM D78185m ASTM D78185m ASTM D78144 *ASTM D7624 *ASTM D7624 *ASTM D7415 method *ASTM D7414	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 >3.0 limit/base >6 >20 >30 limit/base >25	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11 2 ▲ 3.8 current 1.5 9.6 19.9 current 12.9	6 0 46 <1 646 720 774 896 2252 history1 3 1 0.3 history1 1.4 5.2 17.8 history1 9.5	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2 4.4 history2 4.7 9.4 23.8 history2 9.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415 method	250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 >3.0 limit/base >6 >20 >30 limit/base >25	4 0 49 <1 660 ▲ 735 761 911 2127 current 8 11 2 ▲ 3.8 current 1.5 9.6 19.9 current	6 0 46 <1 646 720 774 896 2252 history1 3 3 1 0.3 history1 1.4 5.2 17.8 history1	<1 5 26 <1 351 437 531 583 1405 history2 20 7 2 ▲ 4.4 history2 4.7 9.4 23.8 history2

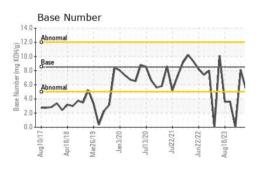


OIL ANALYSIS REPORT





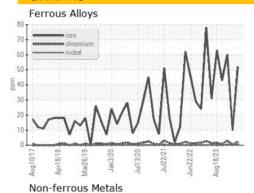


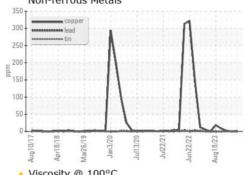


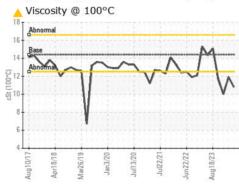
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

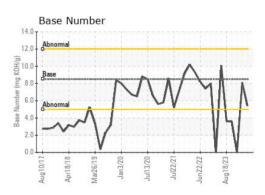
FLUID PROPER	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	144	<u> 10.8</u>	119	<u> 10.0</u>

GRAPHS













Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL06096096

Lab Number : 06096096 Unique Number: 10888949

Tested Diagnosed

: 25 Feb 2024 : 25 Feb 2024 - Wes Davis

Test Package: FLEET (Additional Tests: FuelDilution, PercentFuel) To discuss this sample report, contact Customer Service at 1-800-237-1369.

Received

: 21 Feb 2024

* - 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)

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