

OIL ANALYSIS REPORT

Area (DQR690) 3702

Diesel Engine

CHEVRON DELO 400 SDE SAE 15W40 (--- GAL)

Sample Rating Trend

NORMAL



DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

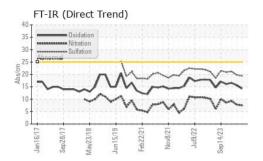
Fluid Condition

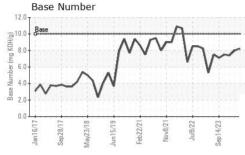
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

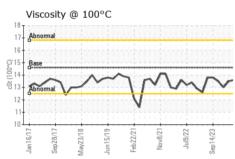
Sample Date	JAL)		nzul/ sepzu	17 May2010 Jun2019	P802021 N0V2021 JUI2022 :	Sep2U23	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 23235 22667 22086 Oil Age hrs Client Info 589 600 600 Oil Changed Changed	Sample Number		Client Info		GFL0072168	GFL0072072	GFL0072105
Oil Age hrs Client Info 589 600 600 Oil Changed Sample Status Client Info Changed C	Sample Date		Client Info		20 Jun 2024	05 Mar 2024	05 Jan 2024
Client Info Changed Changed Changed NORMAL NORMAL ABNORMAL ABNORMAL	Machine Age	hrs	Client Info		23235	22667	22086
CONTAMINATION method militibase current history1 history2	Oil Age	hrs	Client Info		589	600	600
CONTAMINATION method militibase current history1 history2	-		Client Info		Changed	Changed	Changed
Fuel	-						ABNORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 11 15 22 Chromium ppm ASTM D5185m >4 0 0 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >25 0 0 0 Copper ppm ASTM D5185m >25 0 0 0 Copper ppm ASTM D5185m >4 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Vanadium ppm ASTM D5185m 0 0	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 11 15 22 Chromium ppm ASTM D5185m >5 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Continum	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 <1 <1 1 Nickel ppm ASTM D5185m >4 0 0 <1 Titanium ppm ASTM D5185m >2 0 0 <1 Siliver ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >25 0 0 0 Copper ppm ASTM D5185m >100 4 4 18 Tin ppm ASTM D5185m >4 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1	WEAR METAL	S	method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >5 <1 <1 1 Nickel ppm ASTM D5185m >4 0 0 <1 Titanium ppm ASTM D5185m >2 0 0 <1 Siliver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Lead ppm ASTM D5185m >10 4 4 18 Lead ppm ASTM D5185m >10 0 0 1 Copper ppm ASTM D5185m 0 0 0 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 </td <td>Iron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>75</td> <th>11</th> <td>15</td> <td>22</td>	Iron	ppm	ASTM D5185m	>75	11	15	22
Description	Chromium		ASTM D5185m	>5	<1	<1	1
Description			ASTM D5185m	>4	0	0	<1
Silver	Titanium		ASTM D5185m	>2	0	0	<1
Aluminum ppm ASTM D5185m >15 3 2 3 Lead ppm ASTM D5185m >25 0 0 0 Copper ppm ASTM D5185m >100 4 4 18 Tin ppm ASTM D5185m >4 0 0 <1	Silver		ASTM D5185m	>2	0	0	0
Lead ppm ASTM D5185m >25 0 0 0 Copper ppm ASTM D5185m >100 4 4 18 Tin ppm ASTM D5185m >4 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADJUTIVES method limit/base ppm ASTM D5185m 0	Aluminum		ASTM D5185m	>15	3	2	3
Copper ppm ASTM D5185m >100 4 4 18 Tin ppm ASTM D5185m >4 0 0 <1	Lead		ASTM D5185m	>25	0	0	0
Tin	Copper		ASTM D5185m	>100	4	4	18
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 3 2 3 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 61 62 62 Manganese ppm ASTM D5185m 9 0 0 <1 Magnesium ppm ASTM D5185m 915 1039 893 Calcium ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm	• •		ASTM D5185m	>4	0	0	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 3 2 3 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 61 62 62 Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 915 1039 893 Calcium ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Sodium ppm	Vanadium		ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0	Cadmium		ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 61 62 62 Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 915 1039 893 Calcium ppm ASTM D5185m 1052 1150 992 Phosphorus ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 61 62 62 Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 915 1039 893 Calcium ppm ASTM D5185m 1052 1150 992 Phosphorus ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >6 0.5 0.5 0.8	Boron	ppm	ASTM D5185m		3	2	3
Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 915 1039 893 Calcium ppm ASTM D5185m 1052 1150 992 Phosphorus ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7415 >30 19.4 19.	Barium	ppm	ASTM D5185m		0	0	0
Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 915 1039 893 Calcium ppm ASTM D5185m 1052 1150 992 Phosphorus ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7415 >30 19.4 19.	Molybdenum	ppm	ASTM D5185m		61	62	62
Calcium ppm ASTM D5185m 1052 1150 992 Phosphorus ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m 11 15 ▲ 140 Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/amm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base	•	ppm	ASTM D5185m		0	0	<1
Phosphorus ppm ASTM D5185m 760 938 1092 981 Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1	Magnesium	ppm	ASTM D5185m		915	1039	893
Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m 11 15 ▲ 140 Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *AS	Calcium	ppm	ASTM D5185m		1052	1150	992
Zinc ppm ASTM D5185m 800 1261 1324 1152 Sulfur ppm ASTM D5185m 3000 2838 3638 2778 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m 11 15 140 Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM	Phosphorus	ppm	ASTM D5185m	760	938	1092	981
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m 11 15 140 Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6		ppm	ASTM D5185m	800	1261	1324	1152
Silicon ppm ASTM D5185m >25 9 5 9 Sodium ppm ASTM D5185m 11 15 140 Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6	Sulfur	ppm	ASTM D5185m	3000	2838	3638	2778
Sodium ppm ASTM D5185m 11 15 ▲ 140 Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6	Silicon	ppm	ASTM D5185m	>25	9	5	9
Potassium ppm ASTM D5185m >20 4 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6	Sodium	ppm	ASTM D5185m		11	15	<u></u> 140
Soot % % *ASTM D7844 > 6 0.5 0.5 0.8 Nitration Abs/cm *ASTM D7624 > 20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 > 30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 14.3 15.6 16.6	Potassium	ppm	ASTM D5185m	>20		0	2
Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 7.5 7.8 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6	Soot %	%	*ASTM D7844	>6	0.5	0.5	0.8
Sulfation Abs/.1mm *ASTM D7415 >30 19.4 19.8 21.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.3 15.6 16.6							
Oxidation							
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.3	15.6	16.6
	Base Number (BN)	mg KOH/g			8.2	8.0	7.4



OIL ANALYSIS REPORT



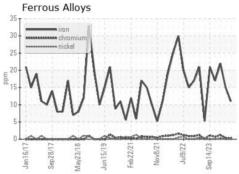


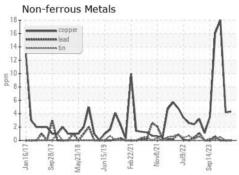


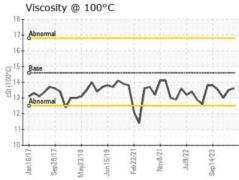
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

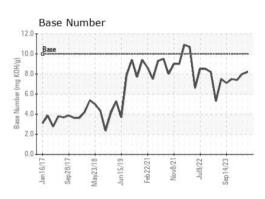
FLUID PROPE	RHES	method			history1	history2
Visc @ 100°C	cSt	ASTM D445	14.6	13.6	13.5	13.0

GRAPHS













Certificate 12367

Laboratory Sample No.

Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Lab Number : 06220918

: GFL0072168 Unique Number : 11099115

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

Received **Tested** Diagnosed

: 26 Jun 2024 : 27 Jun 2024

: 27 Jun 2024 - Sean Felton

GFL Environmental - 094 - Cedartown

2097 Buchanan Highway Cedartown, GA

US 30125 Contact: WILLIAM FOSTER william.foster@gflenv.com

T: (800)207-6618

* - 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)