

# **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 712049

Fluic

Component Diesel Engine

## CHEVRON DELO 400 XLE 15W40 (--- GAL)

# DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

#### 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.

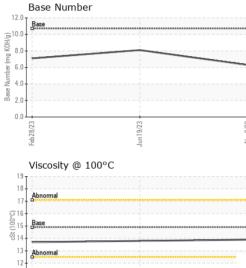
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0096237	GFL0064371	GFL0064444
Sample Date		Client Info		06 Nov 2023	19 Jun 2023	28 Feb 2023
Machine Age	hrs	Client Info		3649	2619	1864
Oil Age	hrs	Client Info		0	172	0
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	c	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	8	2	10
Chromium	ppm	ASTM D5185m		<1	0	<1
Nickel	ppm	ASTM D5185m	>5	4	<1	1
Titanium	ppm	ASTM D5185m		10	4	9
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		2	3	2
Lead	ppm	ASTM D5185m	>40	<1	0	<1
Copper	ppm	ASTM D5185m		<1	<1	3
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 63	history1 205	history2 113
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	63	205	113
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	63 0	205 4	113 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	63 0 48	205 4 77	113 0 64
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	63 0 48 <1	205 4 77 0	113 0 64 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	63 0 48 <1 663	205 4 77 0 538	113 0 64 <1 559
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		63 0 48 <1 663 1433	205 4 77 0 538 1306	113 0 64 <1 559 1489
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	760	63 0 48 <1 663 1433 672	205 4 77 0 538 1306 565	113 0 64 <1 559 1489 672
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	760 830	63 0 48 <1 663 1433 672 837	205 4 77 0 538 1306 565 711	113 0 64 <1 559 1489 672 797
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	760 830 2770 limit/base	63 0 48 <1 663 1433 672 837 2728	205 4 77 0 538 1306 565 711 2635	113 0 64 <1 559 1489 672 797 2468
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	760 830 2770 limit/base	63 0 48 <1 663 1433 672 837 2728 current	205 4 77 0 538 1306 565 711 2635 history1	113 0 64 <1 559 1489 672 797 2468 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	760 830 2770 limit/base	63 0 48 <1 663 1433 672 837 2728 2728 current 5	205 4 77 0 538 1306 565 711 2635 history1 4	113 0 64 <1 559 1489 672 797 2468 history2 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	760 830 2770 limit/base >25	63 0 48 <1 663 1433 672 837 2728 2728 current 5 4	205 4 77 0 538 1306 565 711 2635 history1 4 2	113 0 64 <1 559 1489 672 797 2468 history2 6 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	760 830 2770 limit/base >25 >20	63 0 48 <1 663 1433 672 837 2728 current 5 4 3	205 4 77 0 538 1306 565 711 2635 history1 4 2 2 1	113 0 64 <1 559 1489 672 797 2468 history2 6 0 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	760 830 2770 limit/base >25 >20 limit/base >4	63 0 48 <1 663 1433 672 837 2728 current 5 4 3 current	205 4 77 0 538 1306 565 711 2635 history1 4 2 1 1 history1 0.2	113 0 64 <1 559 1489 672 797 2468 history2 6 0 2 2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	760 830 2770 limit/base >25 >20 limit/base >4	63 0 48 <1 663 1433 672 837 2728 Current 5 4 3 Current 0.6	205 4 77 0 538 1306 565 711 2635 history1 4 2 1 1 history1	113 0 64 <1 559 1489 672 797 2468 history2 6 0 2 history2 0.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	760 830 2770 limit/base >25 >20 limit/base >4 >20	63 0 48 <1 663 1433 672 837 2728 current 5 4 3 current 0.6 9.9	205 4 77 0 538 1306 565 711 2635 history1 4 2 2 1 4 2 1 history1 0.2 6.9	113 0 64 <1 559 1489 672 797 2468 history2 6 0 2 history2 0.5 9.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	760 830 2770 imit/base >25 >20 imit/base >4 >20 >30	63 0 48 <1 663 1433 672 837 2728 <b>current</b> 5 4 3 <b>current</b> 0.6 9.9 22.4	205 4 77 0 538 1306 565 711 2635 history1 4 2 2 1 1 history1 0.2 6.9 21.8	113 0 64 <1 559 1489 672 797 2468 history2 6 0 2 0.5 9.7 21.0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	760 830 2770 <b>limit/base</b> >25 >20 <b>limit/base</b> >4 >20 >30 <b>limit/base</b>	63 0 48 <1 663 1433 672 837 2728 current 5 4 3 current 0.6 9.9 22.4 current	205 4 77 0 538 1306 565 711 2635 history1 4 2 2 1 history1 0.2 6.9 21.8 history1	113 0 64 <1 559 1489 672 797 2468 history2 6 0 2 history2 0.5 9.7 21.0 history2



11 Feb28/23

# **OIL ANALYSIS REPORT**

VISUAL



				ase current	history1	history2
	White Metal	scalar *	Visual NONE	NONE	NONE	NONE
	Yellow Metal	scalar *	Visual NONE	NONE	NONE	NONE
	Precipitate		Visual NONE	NONE	NONE	NONE
	Silt	scalar *	Visual NONE	NONE	NONE	NONE
	Debris		Visual NONE	NONE	NONE	NONE
	Sand/Dirt		Visual NONE	NONE	NONE	NONE
9/23			Visual NORM		NORML	NORML
Jun 19/23	Appearance Odor		Visual NORM		NORML	NORML
	Emulsified Water		Visual >0.2	NEG	NEG	NEG
	Free Water		Visual	NEG	NEG	NEG
	FLUID PROF		method limit/k		history1	history
	Visc @ 100°C		STM D445 14.9	13.9	13.8	13.7
	GRAPHS					
	Ferrous Alloys					
	<sup>10</sup> T					
9/23	iron chromium		1			
Jun 19/23	8- nickel					
	6-					
	m d					
	4	$\backslash$	and the second second			
	2-	$\sim$	And and a state of the state of			
	C	and the second second				
		CO.				
	-eb 28/23	Jun 19/23	Nov6/23			
	Feb	Jun	Nc			
	Non-ferrous Me	etals				
	10 T					
	copper					
	8+ copper					
	8 - tin tin					
	8 - tin tin					
	8 - tin tin					
	8 - tin tin	<u> </u>				
	8 - tin lead					
	8 - tin lead	n19/23	0065/23			
	Lead bound tin bound tin bound tin bound tin bound tin bound to bound the bound tin bound to bound the bo	Juni 1923 -	Nov623			
	Viscosity @ 100	-	Work523	Base Numbe	21	
	Viscosity @ 100	-	No.623	12.0 T	21	
	Viscosity @ 100	-	Sector and the sector	12.0 Base	21	
	Viscosity @ 100	-	Voo623	12.0 Base	21	
	Viscosity @ 100	-	C20900J	12.0 Base	9r	
	Viscosity @ 100	-	Mov6/23	12.0 Base	er	
	Viscosity @ 100	-	Mov6/23	12.0 Base	9 <b>r</b>	
	Viscosity @ 100	-	Mov6/23	12.0 10.0 (b) НОХ В.0 10.0	2r	
	Uiscosity @ 100	-	Morefizia	12.0 Base	9r	
	Viscosity @ 100	D <sub>o</sub> C		12.0 Base (0) HOX Bu 10.0 (0) HOX BU 10.0		
	Viscosity @ 100	D <sub>o</sub> C		12.0 Base (0) HOX Bu 10.0 (0) HOX BU 10.0		
Laborato	Viscosity @ 100 Viscosity @ 100 Viscos	p°C	Eligon n Ave., Cary, NC 2	12.0 Base (0)HOX 000 4.0 2.0 0.0 520 2.0 0.0 520 2.0 0.0 520 520 520 520 520 520 520 520 520 52	er Elefung nvironmental - 624	
Sample I	Viscosity @ 100 Viscosity @ 100 Viscos	- 501 Madisor Received	n Ave., Cary, NC 2 : 13 Nov 202	12.0 Base 10.0 10.0 000 0000 0	Jun 19/23	10164 M-
Sample Num	Viscosity @ 100 Viscosity @ 100 Viscos	- 501 Madisor Received Diagnosed	n Ave., Cary, NC 2 : 13 Nov 202 : 14 Nov 202	12.0 Base 10.0 10.0 000 0000 0	Jun 19/23	10164 M- Elmira,
Sample N Lab Num Unique Nu	Viscosity @ 100 Viscosity @ 100 Viscos	- 501 Madisor Received	n Ave., Cary, NC 2 : 13 Nov 202 : 14 Nov 202	12.0 Base 10.0 10.0 000 0000 0	EZGIUM EZGIUM nvironmental - 624	10164 M <sup>.</sup> Elmira, US 497
Sample M Lab Num Unique Nu ficate L2367 Test Pac	Viscosity @ 100 Viscosity @ 100 Viscos	- 501 Madisor Received Diagnostici	n Ave., Cary, NC 2 : 13 Nov 202 : 14 Nov 202 ian : Wes Davis	12.0 Base 10.0 10.0 000 0000 0	nvironmental - 624	10164 M Elmira, US 497

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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