

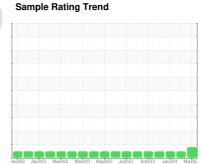
# **OIL ANALYSIS REPORT**



Machine Id 925035-142576

Component **Diesel Engine** 

CHEVRON DELO 400 MULTIGRADE 15W40 (--- LTR)





# **DIAGNOSIS**

## Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

An increase in the copper level is noted. All other component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

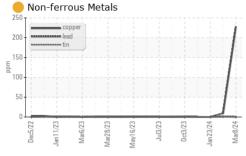
### **Fluid Condition**

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

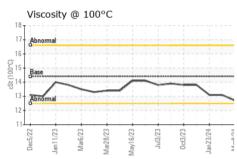
Sample Date         Client Info         08 Mar 2024         01 Feb 2024         23           Machine Age         hrs         Client Info         17249         17132         17           Oil Age         hrs         Client Info         219         102         75           Oil Changed         Client Info         Not Changd         N/A         N/A	history2 FL0103441 3 Jan 2024 7105 5 bt Changd DRMAL history2 <1.0 NEG NEG 0 <1 0 0 3 0 0
Sample Date         Client Info         08 Mar 2024         01 Feb 2024         23           Machine Age         hrs         Client Info         17249         17132         17           Oil Age         hrs         Client Info         219         102         75           Oil Changed         Client Info         Not Changd         N/A         N/6           Sample Status         ATTENTION         NORMAL         N/6           CONTAMINATION         method         limit/base         current         history1           Fuel         WC Method         >3.0         <1.0         <1.0           Water         WC Method         NEG         NEG           Glycol         WC Method         NEG         NEG           WEAR METALS         method         limit/base         current         history1           Iron         ppm         ASTM D5185m         >120         11         5           Chromium         ppm         ASTM D5185m         >20         <1         0           Nickel         ppm         ASTM D5185m         >2         0         0           Silver         ppm         ASTM D5185m         >2         0         0           Aluminum	3 Jan 2024 7105 5 5 6 6 7107 6 7108 7108 7108 7108 7108 7108 7108 7108
Machine Age         hrs         Client Info         17249         17132         17           Oil Age         hrs         Client Info         219         102         75           Oil Changed         Client Info         Not Changd         N/A         No           Sample Status         Norman         Norman         N/A         No           CONTAMINATION         method         limit/base         current         history1           Fuel         WC Method         >3.0         <1.0         <1.0           Water         WC Method         >0.2         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1           Iron         ppm         ASTM D5185m         >120         11         5           WEAR METALS         method         limit/base         current         history1           Iron         ppm         ASTM D5185m         >20         <1         0           Chromium         ppm         ASTM D5185m         >20         <1         0           Nickel         ppm         ASTM D5185m         >2         <0	7105 5 6 6 7105 6 7105 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Oil Age         hrs         Client Info         219         102         75           Oil Changed         Client Info         Not Changd         N/A         Not           Sample Status         Norman         Norman </td <td>obt Changd DRMAL  history2  &lt;1.0  NEG  NEG  history2  5  0  &lt;1  0  0  3  0</td>	obt Changd DRMAL  history2  <1.0  NEG  NEG  history2  5  0  <1  0  0  3  0
Oil Changed Sample Status         Client Info         Not Changd ATTENTION         N/A         N/C           CONTAMINATION         method         limit/base         current         history1           Fuel         WC Method         >3.0         <1.0         <1.0           Water         WC Method         NEG         NEG           Glycol         WC Method         NEG         NEG           WEAR METALS         method         limit/base         current         history1           Iron         ppm         ASTM D5185m         >120         11         5           Chromium         ppm         ASTM D5185m         >20         <1	ot Changd ORMAL history2 <1.0 NEG NEG history2 5 0 <1 0
ATTENTION   NORMAL   Normal	nistory2 <1.0 NEG NEG history2  5 0 <1 0 0 3 0
CONTAMINATION         method         limit/base         current         history1           Fuel         WC Method         >3.0         <1.0	history2 <1.0 NEG NEG history2 5 0 <1 0 0 3 0
Fuel         WC Method         >3.0         <1.0         <1.0           Water         WC Method         NEG         NEG           Glycol         WC Method         NEG         NEG           WEAR METALS         method         limit/base         current         history1           Iron         ppm         ASTM D5185m         >120         11         5           Chromium         ppm         ASTM D5185m         >20         <1	<1.0 NEG NEG history2  5 0 <1 0 0 3 0
Water         WC Method         >0.2         NEG         NEG           Glycol         WC Method         NEG         NEG           WEAR METALS         method         limit/base         current         history1           Iron         ppm         ASTM D5185m         >120         11         5           Chromium         ppm         ASTM D5185m         >20         <1         0           Nickel         ppm         ASTM D5185m         >5         <1         0           Nickel         ppm         ASTM D5185m         >2         0         0           Silver         ppm         ASTM D5185m         >2         0         0           Silver         ppm         ASTM D5185m         >2         0         0           Aluminum         ppm         ASTM D5185m         >20         3         3           Lead         ppm         ASTM D5185m         >40         0         1           Copper         ppm         ASTM D5185m         >15         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1	NEG NEG history2 5 0 <1 0 0 3
WEAR METALS         method         limit/base         current         history1           dron         ppm         ASTM D5185m         >120         11         5           Chromium         ppm         ASTM D5185m         >20         <1	NEG history2  5 0 <1 0 3 0
WEAR METALS         method         limit/base         current         history1           dron         ppm         ASTM D5185m         >120         11         5           Chromium         ppm         ASTM D5185m         >20         <1	history2 5 0 <1 0 0 3 0
ASTM D5185m   >120	5 0 <1 0 0 3
Chromium         ppm         ASTM D5185m         >20         <1         0           Nickel         ppm         ASTM D5185m         >5         <1	0 <1 0 0 3 0
Nickel	<1 0 0 3 0
Titanium         ppm         ASTM D5185m         >2         0         0           Silver         ppm         ASTM D5185m         >2         0         0           Aluminum         ppm         ASTM D5185m         >20         3         3           Lead         ppm         ASTM D5185m         >40         0         1           Copper         ppm         ASTM D5185m         >330         228         9           Tin         ppm         ASTM D5185m         >15         <1	0 0 3 0
Silver         ppm         ASTM D5185m         >2         0         0           Aluminum         ppm         ASTM D5185m         >20         3         3           Lead         ppm         ASTM D5185m         >40         0         1           Copper         ppm         ASTM D5185m         >330         228         9           Tin         ppm         ASTM D5185m         >15         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1           Cadmium         ppm         ASTM D5185m         0         <1           Cadmium         ppm         ASTM D5185m         0         0           ADDITIVES         method         limit/base         current         history1           Boron         ppm         ASTM D5185m         0.4         0         1           Molybdenum         ppm         ASTM D5185m         0.4         0         1           Magnesium         ppm         ASTM D5185m         0         <1           Magnesium         ppm         ASTM D5185m         0         844         896           Calcium         ppm         ASTM D5185m         043         1043         <	0 3 0
Aluminum         ppm         ASTM D5185m         >20         3         3           Lead         ppm         ASTM D5185m         >40         0         1           Copper         ppm         ASTM D5185m         >330         228         9           Tin         ppm         ASTM D5185m         >15         <1	3 0
Lead         ppm         ASTM D5185m         >40         0         1           Copper         ppm         ASTM D5185m         >330         228         9           Tin         ppm         ASTM D5185m         >15         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1           Cadmium         ppm         ASTM D5185m         0         0           ADDITIVES         method         limit/base         current         history1           Boron         ppm         ASTM D5185m         151         18         35           Barium         ppm         ASTM D5185m         0.4         0         1           Molybdenum         ppm         ASTM D5185m         250         75         72           Manganese         ppm         ASTM D5185m         0         44         896           Calcium         ppm         ASTM D5185m         2046         1098         1071           Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	0
Copper         ppm         ASTM D5185m         >330         228         9           Tin         ppm         ASTM D5185m         >15         <1	
Tin	0
Vanadium         ppm         ASTM D5185m         0         <1           Cadmium         ppm         ASTM D5185m         0         0           ADDITIVES         method         limit/base         current         history1           Boron         ppm         ASTM D5185m         151         18         35           Barium         ppm         ASTM D5185m         0.4         0         1           Molybdenum         ppm         ASTM D5185m         250         75         72           Manganese         ppm         ASTM D5185m         0         <1	
Cadmium         ppm         ASTM D5185m         0         0           ADDITIVES         method         limit/base         current         history1           Boron         ppm         ASTM D5185m         151         18         35           Barium         ppm         ASTM D5185m         0.4         0         1           Molybdenum         ppm         ASTM D5185m         250         75         72           Manganese         ppm         ASTM D5185m         0         <1	<1
ADDITIVES         method         limit/base         current         history1           Boron         ppm         ASTM D5185m         151         18         35           Barium         ppm         ASTM D5185m         0.4         0         1           Molybdenum         ppm         ASTM D5185m         250         75         72           Manganese         ppm         ASTM D5185m         0         <1	<1
Boron         ppm         ASTM D5185m         151         18         35           Barium         ppm         ASTM D5185m         0.4         0         1           Molybdenum         ppm         ASTM D5185m         250         75         72           Manganese         ppm         ASTM D5185m         0         <1           Magnesium         ppm         ASTM D5185m         0         844         896           Calcium         ppm         ASTM D5185m         2046         1098         1071           Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	0
Barium         ppm         ASTM D5185m         0.4         0         1           Molybdenum         ppm         ASTM D5185m         250         75         72           Manganese         ppm         ASTM D5185m         0         <1           Magnesium         ppm         ASTM D5185m         0         844         896           Calcium         ppm         ASTM D5185m         2046         1098         1071           Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	history2
Molybdenum         ppm         ASTM D5185m         250         75         72           Manganese         ppm         ASTM D5185m         0         <1           Magnesium         ppm         ASTM D5185m         0         844         896           Calcium         ppm         ASTM D5185m         2046         1098         1071           Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	38
Manganese         ppm         ASTM D5185m         0         <1           Magnesium         ppm         ASTM D5185m         0         844         896           Calcium         ppm         ASTM D5185m         2046         1098         1071           Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	0
Magnesium         ppm         ASTM D5185m         0         844         896           Calcium         ppm         ASTM D5185m         2046         1098         1071           Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	71
Calcium         ppm         ASTM D5185m         2046         1098         1071           Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	<1
Phosphorus         ppm         ASTM D5185m         1043         942         989           Zinc         ppm         ASTM D5185m         943         1138         1211	843
Zinc ppm ASTM D5185m 943 <b>1138</b> 1211	1047
	937
Sulfur ppm ASIM D5185m 5012 <b>2811</b> 3154	1161
	2898
CONTAMINANTS method limit/base current history1	history2
Silicon         ppm         ASTM D5185m         >25         7         4	5
Sodium         ppm         ASTM D5185m         3         4	3
Potassium         ppm         ASTM D5185m         >20         8         5	1
INFRA-RED method limit/base current history1	history2
Soot % % *ASTM D7844 >4 <b>0.3</b> 0.2	0.2
Nitration         Abs/cm         *ASTM D7624         >20         7.5         6.1	5.8
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.5         18.0	17.8
FLUID DEGRADATION method limit/base current history1	
Oxidation	history2
Base Number (BN)         mg KOH/g         ASTM D2896         12.5         7.2         8.7	history2 13.3



# **OIL ANALYSIS REPORT**



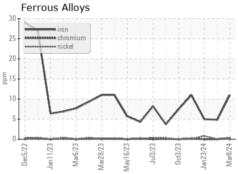
Bas	e Nui	mber						
Base								
8 Base Number (mg KOH/g)	$\overline{}$							
0.8 mper (0.8 mp								1
4.0								
2.0								
0.0 Dec5/22	Jan11/23	Mar6/23 -	Mar28/23 -	May16/23	Jul3/23 -	0ct3/23	Jan23/24 -	M-B.DA

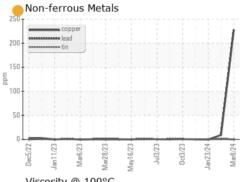


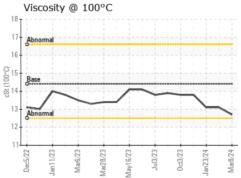
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

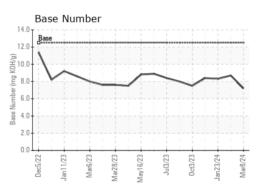
FLUID PROP	EHILES					
Visc @ 100°C	cSt	ASTM D445	14.4	12.7	13.1	13.1

## **GRAPHS**











Certificate L2367

Laboratory Sample No.

Test Package : FLEET

: GFL0103456 Lab Number : 06116930 Unique Number: 10925763

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 13 Mar 2024 **Tested** 

: 14 Mar 2024 Diagnosed : 14 Mar 2024 - Don Baldridge

GFL Environmental - 180 - Tuscaloosa Hauling

4701 12TH ST NE Tuscaloosa, AL US 35404

Contact: FREDERICK ROGERS fred.rogers@gflenv.com

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)

T:

F: