

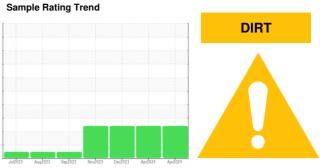
# **OIL ANALYSIS REPORT**





Area
(CX20397)
811070
Component
Diesel Engine

**DIESEL ENGINE OIL SAE 40 (--- LTR)** 



## **DIAGNOSIS**

#### Recommendation

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Resample at the next service interval to monitor.

## Wear

All component wear rates are normal.

## Contamination

Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

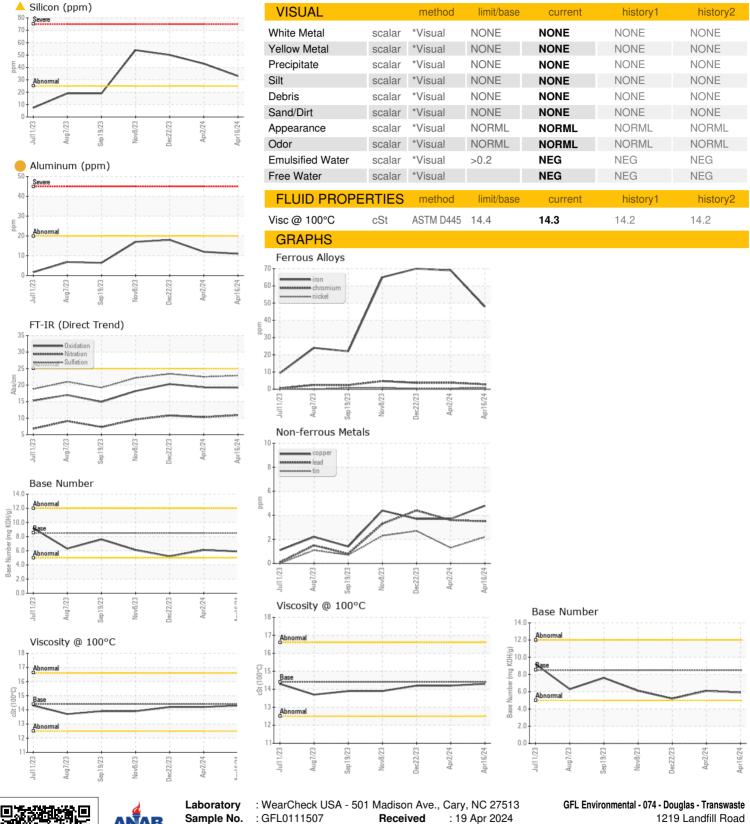
#### **Fluid Condition**

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   0	AE 40 ( LTR)		Jul2023	Aug2023 Sep2023	Nov2023 Dec2023 Apr2024	AprŽ024	
Sample Date   Client Info   0	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Client Info	Sample Number		Client Info		GFL0111507	GFL0111515	GFL0083097
Machine Age         hrs         Client Info         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 <td></td> <td></td> <td>Client Info</td> <td></td> <th>16 Apr 2024</th> <td>02 Apr 2024</td> <td>22 Dec 2023</td>			Client Info		16 Apr 2024	02 Apr 2024	22 Dec 2023
Dil Age	•	hrs	Client Info		-	0	0
Dil Changed   Client Info		hrs	Client Info		0	0	0
ABNORMAL   ABNORMAL   ABNORMAL   ABNORMAL   ABNORMAL   CONTAMINATION   method   limit/base   current   history1   history2			Client Info		N/A	N/A	Changed
Fuel	-				ABNORMAL	ABNORMAL	ABNORMAL
Water Glycol         WC Method WC Method         >0.2.2         NEG NEG NEG NEG         NEG NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >12.0         48         69         70           Chromium         ppm         ASTM D5185m         >2.0         3         4         4           Nickel         ppm         ASTM D5185m         >5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Calycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           ron         ppm         ASTM D5185m         >120         48         69         70           Chromium         ppm         ASTM D5185m         >20         3         4         4           Nickel         ppm         ASTM D5185m         >5         <1	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Post	Glycol		WC Method		NEG	NEG	NEG
Chromium   ppm   ASTM D5185m   >20   3   4   4	WEAR METAL	S	method	limit/base	current	history1	history2
Strickel	ron	ppm	ASTM D5185m	>120	48	69	70
Description	Chromium	ppm	ASTM D5185m	>20	3	4	4
Titanium	Nickel				<1	<1	<1
Silver	Titanium	ppm	ASTM D5185m	>2	1	<1	1
Lead         ppm         ASTM D5185m         >40         4         4         4         4           Copper         ppm         ASTM D5185m         >330         5         4         4           Vanadium         ppm         ASTM D5185m         >15         2         1         3           Vanadium         ppm         ASTM D5185m         <1         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         10         8         11           Barium         ppm         ASTM D5185m         100         61         62         65           Magnesium         ppm         ASTM D5185m         100         61         62         65           Magnesium         ppm         ASTM D5185m         450         745         864         871           Calcicium         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350	Silver		ASTM D5185m	>2	<1	0	0
Lead         ppm         ASTM D5185m         >40         4         4         4         4           Copper         ppm         ASTM D5185m         >330         5         4         4           Fin         ppm         ASTM D5185m         >15         2         1         3           Vanadium         ppm         ASTM D5185m         <1         <1         0         0           Cadmium         ppm         ASTM D5185m         <1         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         10         8         11           Barium         ppm         ASTM D5185m         100         0         0         0           Molybdenum         ppm         ASTM D5185m         100         61         62         65           Magnesium         ppm         ASTM D5185m         450         745         864         871           Calcicium         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350 <t< td=""><td>Aluminum</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;20</td><th><u> </u></th><td><b>1</b>2</td><td><b>1</b>8</td></t<>	Aluminum	ppm	ASTM D5185m	>20	<u> </u>	<b>1</b> 2	<b>1</b> 8
STIN   ppm   ASTM D5185m   >15   2   1   3   3   2   2   3   3   2   3   3   3	_ead		ASTM D5185m	>40	4	4	4
STIN   ppm   ASTM D5185m   >15   2   1   3   3   2   2   3   3   2   3   3   3	Copper		ASTM D5185m	>330	5	4	4
Cadmium         ppm         ASTM D5185m         <1         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         10         8         11           Barium         ppm         ASTM D5185m         10         0         0         0           Molybdenum         ppm         ASTM D5185m         100         61         62         65           Manganese         ppm         ASTM D5185m         100         61         62         65           Manganesium         ppm         ASTM D5185m         450         745         864         871           Calcium         ppm         ASTM D5185m         3000         1365         1555         1324           Phosphorus         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         >25         33         43         50           Solicon         ppm         ASTM D5185m         >216         4					2	1	3
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         250         10         8         11           Barium         ppm         ASTM D5185m         10         0         0         0           Molybdenum         ppm         ASTM D5185m         100         61         62         65           Manganese         ppm         ASTM D5185m         100         745         864         871           Magnesium         ppm         ASTM D5185m         3000         1365         1555         1324           Phosphorus         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         33         43         50           Soldium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m	Vanadium	ppm	ASTM D5185m		<1	<1	0
Soron   ppm   ASTM D5185m   250   10   8   11	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         100         61         62         65           Manganese         ppm         ASTM D5185m         < 1         2         1           Magnesium         ppm         ASTM D5185m         450         745         864         871           Calcium         ppm         ASTM D5185m         3000         1365         1555         1324           Phosphorus         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         33         43         50           Sodium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >4         0.5	Boron	ppm	ASTM D5185m	250	10	8	11
Manganese         ppm         ASTM D5185m         <1         2         1           Magnesium         ppm         ASTM D5185m         450         745         864         871           Calcium         ppm         ASTM D5185m         3000         1365         1555         1324           Phosphorus         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         ▲ 33         ▲ 43         ▲ 50           Sodium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844 <td< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>10</td><th>0</th><td>0</td><td>0</td></td<>	Barium	ppm	ASTM D5185m	10	0	0	0
Magnesium         ppm         ASTM D5185m         450         745         864         871           Calcium         ppm         ASTM D5185m         3000         1365         1555         1324           Phosphorus         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         ▲ 33         ∠         43         ▲ 50           Sodium         ppm         ASTM D5185m         >216         4         3         ∠         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation </td <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>100</td> <th>61</th> <td>62</td> <td>65</td>	Molybdenum	ppm	ASTM D5185m	100	61	62	65
Calcium         ppm         ASTM D5185m         3000         1365         1555         1324           Phosphorus         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Soliticon         ppm         ASTM D5185m         >25         33         43         50           Soliticon         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION	Manganese	ppm	ASTM D5185m		<1	2	1
Phosphorus         ppm         ASTM D5185m         1150         879         1000         933           Zinc         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         33         43         50           Sodium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method <td>Magnesium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>450</td> <th>745</th> <td>864</td> <td>871</td>	Magnesium	ppm	ASTM D5185m	450	745	864	871
Zinc         ppm         ASTM D5185m         1350         1078         1199         1123           Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         33         43         50           Sodium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm	Calcium	ppm	ASTM D5185m	3000	1365	1555	1324
Sulfur         ppm         ASTM D5185m         4250         2594         3126         2308           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         ▲ 33         ▲ 43         ▲ 50           Sodium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	Phosphorus	ppm	ASTM D5185m	1150	879	1000	933
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         ▲ 33         ▲ 43         ▲ 50           Sodium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	Zinc	ppm	ASTM D5185m	1350	1078	1199	1123
Silicon         ppm         ASTM D5185m         >25         ▲ 33         ▲ 43         ▲ 50           Sodium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	Sulfur	ppm	ASTM D5185m	4250	2594	3126	2308
Sodium         ppm         ASTM D5185m         >216         4         3         2           Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         4         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	Silicon	ppm	ASTM D5185m	>25	<b>△</b> 33	<b>4</b> 3	<b>△</b> 50
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	Sodium	ppm	ASTM D5185m	>216	4	3	2
Soot %         %         *ASTM D7844 >4         0.5         0.5         0.8           Nitration         Abs/cm         *ASTM D7624 >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415 >30         22.9         22.5         23.4           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         19.2         19.3         20.3	Potassium	ppm	ASTM D5185m	>20	4	0	1
Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	INFRA-RED		method	limit/base	current	history1	history2
Nitration         Abs/cm         *ASTM D7624         >20         10.9         10.3         10.8           Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	Soot %	%	*ASTM D7844	>4	0.5	0.5	0.8
Sulfation         Abs/.1mm         *ASTM D7415         >30         22.9         22.5         23.4           FLUID DEGRADATION method limit/base current history1         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.2         19.3         20.3	Vitration	Abs/cm	*ASTM D7624	>20			10.8
Oxidation	Sulfation						
	FLUID DEGRA	OATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	19.2	19.3	20.3
	Base Number (BN)	mg KOH/g			5.9	6.1	



# **OIL ANALYSIS REPORT**







Certificate 12367

Lab Number : 06153990 Unique Number : 10989413

Test Package : FLEET

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

Tested : 22 Apr 2024

Diagnosed : 23 Apr 2024 - Don Baldridge

Douglas, GA

US 31533 Contact: CURTIS JACOBS CURTIS.JACOBS@GFLENV.COM

\* - 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: (912)384-6001