

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 813008

Component Diesel Engine Fluid DIESEL ENGINE OIL SAE 40 (--- 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.

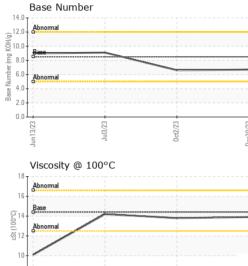
			3 Jul2023	0ct2023 D		
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0098220	GFL0083903	GFL0083853
Sample Date		Client Info		30 Dec 2023	02 Oct 2023	03 Jul 2023
Machine Age	hrs	Client Info		3114	2522	0
Oil Age	hrs	Client Info		3114	2522	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
-	<u>_</u>		11 11 /1	-		
WEAR METAL	5	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	21	24	2
Chromium	ppm	ASTM D5185m	>20	1	1	<1
Nickel	ppm	ASTM D5185m	>4	5	3	<1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	0	<1
Lead	ppm	ASTM D5185m	>40	0	<1	0
Copper	ppm	ASTM D5185m	>330	7	8	0
Tin	ppm	ASTM D5185m	>15	<1	1	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 250	current 8	history1 4	history2 15
	ppm ppm					
Boron Barium		ASTM D5185m	250	8	4	15
Boron	ppm	ASTM D5185m ASTM D5185m	250 10	8 0	4 0	15 0
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	8 0 59	4 0 57	15 0 54
Boron Barium Molybdenum	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	8 0 59 <1	4 0 57 <1	15 0 54 0
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	8 0 59 <1 932	4 0 57 <1 988	15 0 54 0 970
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	8 0 59 <1 932 1070 975	4 0 57 <1 988 1114	15 0 54 0 970 1034
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	8 0 59 <1 932 1070	4 0 57 <1 988 1114 990	15 0 54 0 970 1034 1017
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	250 10 100 450 3000 1150 1350	8 0 59 <1 932 1070 975 1201	4 0 57 <1 988 1114 990 1282	15 0 54 0 970 1034 1017 1240
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	250 10 100 450 3000 1150 1350 4250	8 0 59 <1 932 1070 975 1201 2651	4 0 57 <1 988 1114 990 1282 2861	15 0 54 0 970 1034 1017 1240 3710
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	250 10 100 450 3000 1150 1350 4250 limit/base >25	8 0 59 <1 932 1070 975 1201 2651 current	4 0 57 <1 988 1114 990 1282 2861 kistory1	15 0 54 0 970 1034 1017 1240 3710 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	250 10 100 450 3000 1150 1350 4250 limit/base >25	8 0 59 <1 932 1070 975 1201 2651 2651 current 3	4 0 57 <1 988 1114 990 1282 2861 history1 4	15 0 54 0 970 1034 1017 1240 3710 history2 1
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	250 10 100 450 3000 1150 1350 4250 imit/base >25 >216	8 0 59 <1 932 1070 975 1201 2651 2651 current 3 <1	4 0 57 <1 988 1114 990 1282 2861 history1 4 3	15 0 54 0 970 1034 1017 1240 3710 history2 1 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20	8 0 59 <1 932 1070 975 1201 2651 current 3 <1 0	4 0 57 <1 988 1114 990 1282 2861 history1 4 3 2	15 0 54 0 970 1034 1017 1240 3710 history2 1 <1 <1 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 ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Iimit/base >25 >216 >20 Iimit/base >3	8 0 59 <1 932 1070 975 1201 2651 <u>current</u> 3 <1 0 <u>current</u>	4 0 57 <1 988 1114 990 1282 2861 history1 4 3 2 bistory1 0.8	15 0 54 0 970 1034 1017 1240 3710 history2 1 <1 <1 0 history2 0.1
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 ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 Imit/base >25 >216 >20 Imit/base	8 0 59 <1 932 1070 975 1201 2651 current 3 <1 0	4 0 57 <1 988 1114 990 1282 2861 history1 4 3 2 2 history1	15 0 54 0 970 1034 1017 1240 3710 history2 1 <1 <1 0 history2
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	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >25 >216 >20 imit/base >3 >3	8 0 59 <1 932 1070 975 1201 2651 current 3 <1 0 current 0.8 9.1	4 0 57 <1 988 1114 990 1282 2861 history1 4 3 2 history1 0.8 9.0	15 0 54 0 970 1034 1017 1240 3710 history2 1 <1 <1 0 <i>history2</i> 0.1 5.1
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 D7844 *ASTM D7844 *ASTM D7844	250 10 100 450 3000 1150 1350 4250 imit/base >25 >216 >20 imit/base >3 >20 >30	8 0 59 <1 932 1070 975 1201 2651 Current 3 <1 0 Current 0.8 9.1 20.7 Current	4 0 57 <1 988 1114 990 1282 2861 history1 4 3 2 history1 0.8 9.0 21.2 history1	15 0 54 0 970 1034 1017 1240 3710 history2 1 <1 <1 0 history2 0.1 5.1 18.3 history2
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	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >216 >216 >20 imit/base >3 >20 >30	8 0 59 <1 932 1070 975 1201 2651 <u>current</u> 3 <1 0 <u>current</u> 0.8 9.1 20.7	4 0 57 <1 988 1114 990 1282 2861 history1 4 3 2 kistory1 0.8 9.0 21.2	15 0 54 0 970 1034 1017 1240 3710 history2 1 <1 <1 0 bistory2 0.1 5.1 18.3



Jun13/23

OIL ANALYSIS REPORT

VISUAL



Jul3/23

	-	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
6	0ct2/23 Dec30/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
0	Dec 0	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
2		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	· · · · · · · · · · · · · · · · · · ·	Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	14.4	13.9	13.8	14.2
		GRAPHS						
		Ferrous Alloys						
c.	0ct2/23 +	iron			-			
0	000	20 - nickel	/					
		15						
			/					
		10	/					
		5	[- Tortor to industry in the limit	and the second			
			No. of the other designs to th					
		un 13/23 - Jul3/23 -		0ct2/23 -	Dec30/23 -			
		Jun1		00	Dec3			
		Non-ferrous Meta	ls					
		16 14						
		12						
		10						
		<u>ة</u> 8						
		6	/					
		4	/					
		2		and Witness Constant in Street Street				
		13/23	Annen and Annen and		53			
		Jun 13/23 Jul3/23		0ct2/23	Dec30/23			
		Viscosity @ 100°C	2			Base Number		
		18			14.0			
		17 Abnormal		1	12.0	Abnormal		1 1
		15 Bare			(^B H)10.0-			
		G 14 Base 00 14 Kg 13 Abnormal			- Ĕ 8.0-	uase		
					e 6.0·	Abnormal		
		12			器 4.0・	·		
					HO 10.0 HO 10.0 Bu 8.0 Bu 8.0	•		
		12 11 10 9			2.0			
		12 11 10 9		ct2/23	2.0	13/23	ç	ct2/23
		12		0ct2/23	2.0	Jun 13/23	CC CC	0000/13
	l aboratory	12 11 10 9 EZ/E1 10 9 EZ/E1 10 9	501 Madie		0.0 0.0	۲ ۲		
	Laboratory Sample No.	12 11 10 9	501 Madis Recieved	on Ave., Ca	0.0 0.0	۲ ۲	nmental - 652 - Fre	
	Sample No. Lab Number	: WearCheck USA - 4 : GFL0098220 : 06050410	Recieved Diagnose	on Ave., Ca I : 03 c ed : 04 c	2.0- 0.0- ry, NC 27513 Jan 2024 Jan 2024	۲ ۲	nmental - 652 - Fre 1095	dericksburg Haul 54 Houser Dri dericksburg, ^v
THE MANNEY	Sample No.	: WearCheck USA - : GFL0098220 : 06050410 : 10816359	Recieved	on Ave., Ca I : 03 c ed : 04 c	2.0- 0.0- ry, NC 27513 Jan 2024	GFL Enviro	nmental - 652 - Fre 1095	dericksburg Haul 54 Houser Dri dericksburg, V US 224

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

Submitted By: TECHNICIAN ACCOUNT