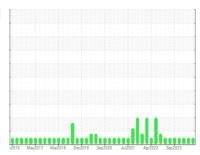


OIL ANALYSIS REPORT

Sample Rating Trend









Machine Id 2460 MACK GRANITE

Component

Diesel Engine

DIESEL ENGINE OIL SAE 40 (48 QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

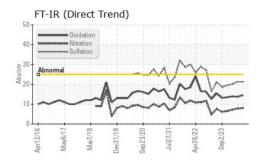
Fluid Condition

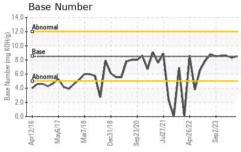
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

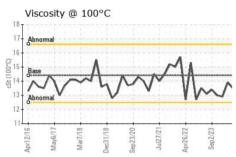
Sample Date	AE 40 (48 Q1S)		r2016 May20	117 Mar2018 Dec2018	Sep2020 Jul2021 Apr2022 8	Sep 2023	
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 37704 37090 36568 Oil Age hrs Client Info 0 0 0 0 Oil Changed Client Info Changed Cha	Sample Number		Client Info		GFL0127946	GFL0117454	GFL0103221
Oil Age hrs Client Info 0 0 0 0 Oil Changed Sample Status Client Info Changed Changed Changed Changed Changed Changed Changed Changed NORMAL NORMAL NORMAL NORMAL NORMAL Changed C	Sample Date		Client Info		12 Jul 2024	19 Apr 2024	18 Jan 2024
Client Info Changed Changed Changed NORMAL NORMAL NORMAL NORMAL	Machine Age	hrs	Client Info		37704	37090	36568
CONTAMINATION	Oil Age	hrs	Client Info		0	0	0
Fuel	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >12.0 12 13 11 Chromium ppm ASTM D5185m >2.0 <1 <1 <1 Nickel ppm ASTM D5185m >5 0 0 0 0 Silver ppm ASTM D5185m >2 0 <1 0 0 Aluminum ppm ASTM D5185m >2 0 <1 0 0 Aluminum ppm ASTM D5185m >40 3 4 2	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	12	13	11
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>5	0	0	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead	Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper ppm ASTM D5185m >330 2 2 2 Tin ppm ASTM D5185m >15 0 1 <1	Aluminum	ppm	ASTM D5185m	>20	3	3	<1
Tin	Lead	ppm	ASTM D5185m	>40	3	4	2
Vanadium ppm ASTM D5185m 0 <1 <1 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 5 5 2 Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 56 64 60 Manganese ppm ASTM D5185m 0 0 <1 0 Magnesium ppm ASTM D5185m 450 891 978 1002 Calcium ppm ASTM D5185m 450 891 978 1002 Calcium ppm ASTM D5185m 1150 868 1162 1077 Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m >25 3 5 <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>>330</td><th>2</th><td>2</td><td>2</td></t<>	Copper	ppm	ASTM D5185m	>330	2	2	2
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 250 5 5 2 Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 56 64 60 Manganese ppm ASTM D5185m 100 0 0 <1	Tin	ppm	ASTM D5185m	>15	0	1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	<1	<1
Boron	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium ppm ASTM D5185m 10 0 0 0 Molybdenum ppm ASTM D5185m 100 56 64 60 Magnesium ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 450 891 978 1002 Calcium ppm ASTM D5185m 3000 1092 1124 1048 Phosphorus ppm ASTM D5185m 3000 1092 1124 1048 Phosphorus ppm ASTM D5185m 1150 868 1162 1077 Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >216 0 0 2 Sodium ppm <	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 100 56 64 60 Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 450 891 978 1002 Calcium ppm ASTM D5185m 3000 1092 1124 1048 Phosphorus ppm ASTM D5185m 1150 868 1162 1077 Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >20 1 3 <1 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >4 1.7	Boron	ppm	ASTM D5185m	250		5	
Manganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 450 891 978 1002 Calcium ppm ASTM D5185m 3000 1092 1124 1048 Phosphorus ppm ASTM D5185m 1150 868 1162 1077 Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1	Barium	ppm				-	
Magnesium ppm ASTM D5185m 450 891 978 1002 Calcium ppm ASTM D5185m 3000 1092 1124 1048 Phosphorus ppm ASTM D5185m 1150 868 1162 1077 Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1	-	ppm		100			
Calcium ppm ASTM D5185m 3000 1092 1124 1048 Phosphorus ppm ASTM D5185m 1150 868 1162 1077 Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1	-	ppm	ASTM D5185m		-		
Phosphorus ppm ASTM D5185m 1150 868 1162 1077 Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1	-	ppm	ASTM D5185m				
Zinc ppm ASTM D5185m 1350 1200 1282 1269 Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1		ppm					
Sulfur ppm ASTM D5185m 4250 2692 3295 3047 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1							
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1							
Silicon ppm ASTM D5185m >25 3 5 4 Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1.7 2.2 1.5 Nitration Abs/cm *ASTM D7624 >20 8.0 7.8 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9			ASTM D5185m	4250	2692	3295	3047
Sodium ppm ASTM D5185m >216 0 0 2 Potassium ppm ASTM D5185m >20 1 3 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1.7 2.2 1.5 Nitration Abs/cm *ASTM D7624 >20 8.0 7.8 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9		ITS	method		current	history1	history2
Potassium ppm ASTM D5185m >20 1 3 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1.7 2.2 1.5 Nitration Abs/cm *ASTM D7624 >20 8.0 7.8 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9	Silicon						
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 1.7 2.2 1.5 Nitration Abs/cm *ASTM D7624 >20 8.0 7.8 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9		ppm	ASTM D5185m	>216			
Soot % % *ASTM D7844 >4 1.7 2.2 1.5 Nitration Abs/cm *ASTM D7624 >20 8.0 7.8 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9		ppm	ASTM D5185m	>20	1	3	
Nitration Abs/cm *ASTM D7624 >20 8.0 7.8 7.2 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 20.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9							
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9							
Oxidation Abs/.1mm *ASTM D7414 >25 14.5 13.7 13.9	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.3	21.3	20.1
	FLUID DEGRA	NOITAC	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 8.5 8.5 8.3 8.6	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.5	13.7	13.9
	Base Number (BN)	mg KOH/g	ASTM D2896	8.5	8.5	8.3	8.6



OIL ANALYSIS REPORT



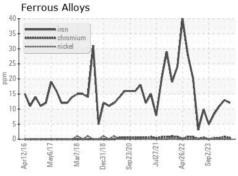


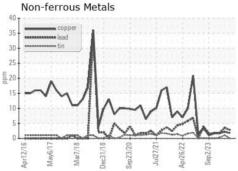


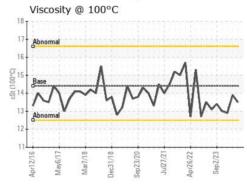
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

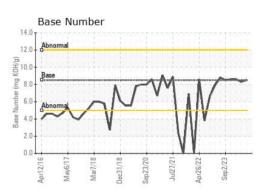
FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	13.5	13.9	12.9

GRAPHS













Laboratory Sample No.

: GFL0127946 Lab Number : 06237626

Unique Number : 11126460

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 16 Jul 2024

Tested : 17 Jul 2024 Diagnosed : 17 Jul 2024 - Wes Davis

GFL Environmental - 001 - Raleigh(CNG)

3741 Conquest Drive Garner, NC US 27529

Contact: Craig Johnson craig.johnson@gflenv.com

T: (919)662-7100 F: (919)662-7130

Test Package : FLEET Certificate 12367 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)